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QUEENSLAND AGRICULTURAL JOURNAL

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Event and Comment.

Farm Exhibits at the Brisbane Show.

IN former years the open farm crop section was a very popular feature of the Brisbane Exhibition. As promoting friendly rivalry among competing farmers of various districts of Queensland and Northern New South Wales, the value of this open section educationally and otherwise was undoubted. Its omission this year was, therefore, regretted and it is hoped that the Royal National Agricultural Society will see its way clear to restore it in future show schedules.

This year there were only four district exhibits, three from Queensland and one from New South Wales and all of A grade. An immense amount of work had been put into the preparation of these exhibits and in each the handiwork and skill of the woman as well as the man on the land were strongly evident. West Moreton gained the first award and all associated with the other district displays merited high commendation for their array of rural wealth, industry, and enterprise.

The varieties of chaff and baled hay, especially lucerne, both green and sweated, were excellent; and it was good to see samples of the lesser used but nevertheless important chaffs, such as white panicum, sudan, and some of the introduced grasses. The baled hays also were generally well prepared. The sheaves of oats and wheats were representative of a number of varieties, but while well cured and of good quality they were not as attractive in get-up as the baled hay.

The grains, with one exception, were not as good as those shown in former years. The exception was the maize, both ears and grain, in the New South Wales exhibit in which every entry was an excellent specimen of the variety it represented. In some of the other district

exhibits the grain and ears also were of good quality, although some of the varieties were off type and incorrectly named. The wheat was much below the usual high standard in the Brisbane Show, because no doubt of the unfavourable season for grain growing last year, when crop yields in Queensland were the lowest for a very long time. The oats and barley entries were up to their usual high standard.

The potato exhibits in each district display were very good examples of a wide range of varieties and those from North Queensland merited particular attention. Until recently, potato growing in the North was only on a very small scale, but after the entry of Japan into the war northern farmers did a grand job in producing some thousands of tons a year. The value of this national service cannot be over-estimated, for not only were supplies produced for Army requirements but shipping and rail space, which otherwise would have had to be used for the carriage of potatoes from the south, was conserved for the transport of war material for defence forces in advanced areas.

Sweet potatoes also were prominent in each section and included many varieties for both table and stock use. It is often wondered if the average housewife appreciates to any extent the food value of a good sweet potato for culinary use. If the best varieties were marketed for the table, any prejudice against them as a menu item would soon be dissolved. Pumpkins made up another attractive display. Of the table varieties, the Beaudesert or "Queensland Blue" had pride of place. The pumpkin crop is now an important one in this State and is only exceeded in annual value by five or six other field crops.

The wide range of fodders shown indicated the fertility of the country on which they were grown. In addition to the greens and grains, there were several kinds of ensilage of good quality, including trench-conserved material.

Among other crops staged in the district exhibits tobacco, cotton, and peanuts claimed close attention. Perhaps greater prominence could have been given to these entries, especially in the North Queensland and Darling Downs sections—two of the principal tobacco districts in Australia—for each has obviously a big future in our agricultural economy. According to the recent report of the Commonwealth Mission of Investigation into the soy bean industry of the United States of America, all available evidence points to the desirability of our developing a more extensive vegetable oil industry and, consequently, to the necessity for an intensive research programme which would include additional industrial uses as well as plant breeidng and field trials. If undertaken, this work would no doubt cover other vegetable oil-producing plants besides those already established in Queensland agriculture. The field for the expansion of these important crops is very wide, particularly cotton, of which the present decline in cultivation is, it is hoped, only temporary. Apart from primary purposes and use in vegetable oil extraction, an expansion of cotton and peanut acreage would lead to an increase in the output of protein-rich stock foods which, is turn, would have an important bearing on increased dairy production. It is hoped, therefore, that these valuable crops will be given greater prominence in the district displays at future Brisbane Shows.

Generally, the regional farm exhibits were worthy of the richly fertile provinces they represented.

Some Aspects of the Problem of Soil Erosion Control in Queensland Cane Fields.*

W. J. S. SLOAN.

MANY of the cane growing areas of Queensland are subject to serious soil erosion. Cane is a moisture loving plant and its culture is carried on in a belt of country which is characterised by heavy to very heavy summer rainfall. Soil losses on sloping land within this belt are, consequently, often extensive. Very commonly the soil lost in erosion consists of the fertile surface layer which is higher in organic matter, nitrogen and other mineral plant foods than the underlying soil. Extra ploughings and cultivations are required to smooth out gutters and rills which form in fields, thus adding to the costs of seed bed preparation and the costs of cultivation in the growing crop. Unchecked, erosion inevitably leads to the development of uncultivable gullies and the throwing of land out of cultivation.

The illustrations accompanying this article show some evidence of soil erosion which is occurring in the Isis district.

Unfortunately, this district was particularly liable to severe erosion during the summer of 1946-47, because of the unusually large acreage of land which was in bare fallow, ready for late summer and early autumn planting. This position had been created by the severe drought of 1946, which killed much standing cane and left it unfit for harvest during the 1946 crushing season. Instead of ratooning cane so affected, many farmers, by various methods, incorporated the trash, cane stalks and stools in the soil and prepared for a new planting in 1947, thus exposing an abnormally large area to severe erosion. It is interesting to note that events have since indicated that the apparently dead stools were capable of satisfactory ratooning and that it was a mistake to plough out so many fields, when they could have been ratooned profitably at less expense than was required to prepare the land for planting.

A further cause of the widespread erosion in the Isis district was the fact that unusually heavy rains aggregating approximately ten inches in twelve hours were recorded on one day in mid-February, and then again a similar fall was experienced on 1st March, just after many fields had been worked up after the first destructive rain group. With such torrential rain and so many acres of bare loose soil exposed, heavy soil losses were inevitable.

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* From the *Cane Growers' Quarterly* for April, 1947 (Bur. Sug. Expt. Stns., Dept. Ag. & Stk., Q.).

Plate 49.

SHOWING SEVERE EROSION DOWN TO THE PLOUGH SOLE ON HILLSIDES OF A CHILDERS CANE FARM.—Note the abundance of cane stalks in the soil in the foreground. These were residues from the previous dead cane crop which was ploughed in.

Plate 50.

AN ERODED GULLY IN THE FIELD SHOWN IN PLATE 49.

Perhaps one of the most spectacular effects of the heavy rain is shown in Figs. 100-103. These illustrate a strong dam which was built in a gully to check loss of soil from a cultivated field by causing silting of the channel. Logs of 30 feet length and 15 inches in diameter were placed across the gully and held in position by strong supporting posts. Galvanised iron was nailed on the upstream side of the logs to prevent seepage of water and silt through cracks between the logs, while on the waterfall side a concrete slab was constructed at the base to break the fall of the water and prevent scouring. This dam appeared to be quite strong enough to resist pressure from water which was likely to collect from rainfall on the catchment area *which was only about six to seven acres in area.* Figs. 102 and 103, however, show what happened after

Plate 51.

Erosion on a Slope of a Childers Cane Field.—This slope was badly eroded after the mid-February rains in 1947, was re-worked and again eroded as illustrated after the early March rains.

the heavy rainfall of mid-February, 1947, and clearly illustrate the difficulty of economically checking erosion on land with a slope greater than 10 per cent. The rush of water down this comparatively short channel (Fig. 103) was sufficiently strong to carry one of the 30 feet logs a distance of 10 chains into a neighbouring cane field and to move pieces of concrete, two hundred weight or more in weight, at least two chains downstream. In addition, most of the silt previously caught and held in the dam was scoured out.

The field comprising the catchment area was lying in a roughly ploughed state prior to the rain and contained a large quantity of ploughed-in dead cane material left over from the previous harvest, particularly along the sides of the gully where much of the standing cane was unharvested in 1946 because it died in the drought. Absorption of the

Plate 52.

PHOTOGRAPH IN WINTER, 1946, TAKEN FROM UPSTREAM SIDE OF DAM BUILT TO CAUSE SILTING OF GULLY AND CHECK SOIL LOSS IN A CHILDERS CANE FIELD.—Note that silting had already commenced.

Plate 53.

PHOTOGRAPH OF DAM SHOWN IN PLATE 52, TAKEN FROM DOWNSTREAM SIDE.

Plate 54.

PHOTOGRAPH OF DAM AFTER HEAVY MID-FEBRUARY RAINS IN 1947, TAKEN FROM UPSTREAM SIDE, SHOWING DESTRUCTION OF DAM AND SCOURING OUT OF SILT, WHICH HAD ACCUMULATED PREVIOUSLY.

Plate 55.

PHOTOGRAPH OF DAM SHOWN IN PLATE 54, TAKEN FROM DOWNSTREAM SIDE.—The cane shown in Plates 52 and 53 subsequently died during the drought of 1946, and was not fit for harvest. The residues were ploughed in prior to the heavy rain.

early rain was good, but the loose soil later became saturated and commenced to move downwards when moving water appeared on the soil surface as the rain continued. Much soil was lost and many wide gutters were washed out in the cultivation in addition to the scouring and destruction of the dam. The former effect considerably hampered the subsequent preparation of a suitable seed bed for the autumn planting.

Plate 56.

EROSION ON A SLOPE OF A CHILDERS CANE FIELD.—In the foreground is a wide expanse of eroded soil deposited on a grass paddock. At the top of the hill, the land is being re-worked to fill in gutters in preparation for cane planting. Heavy rain in early March again severely eroded this area.

In terms of length of land use, Queensland cane-growing areas are still very young, and many present-day farmers are not yet fully cognisant of the dangers of soil erosion. A number of eroded soils have sufficient soil depth to permit repeated turning up of a fresh layer for cultivation and with the use of fertilizers it has been possible to continue profitable production on such land for some time, hence the tendency of many farmers to pay little heed to the menace of soil erosion. However, very few of the sloping areas can continue indefinitely with this process and ultimately land so treated will have to be abandoned for further cultivation.

Although none of the world's research stations has developed detailed methods of control for heavy rainfall areas such as the Queensland cane-growing districts, a survey of the Queensland cane belt reveals that commonsense methods could be applied in many instances to reduce soil losses. Too many farmers still plant and cultivate up and down the slopes. Fires are allowed to burn hillsides clear of vegetation and later excess water from these hillsides, unimpeded by a grass and weed cover, pours down swiftly over unprotected cultivations. Where possible grassed and graded diversion ditches should be formed to carry water away from cultivations, while any unnecessary burning of crop residues should be avoided.

The problem of arresting soil erosion and deterioration in Queensland canefields is a difficult one and is not made any easier by the system of monoculture characteristic of the industry, and the erratic rainfall of the cane-growing belt. A thorough examination needs to be made of the merits of contour farming, alone and supplemented by terracing. Strip cropping on certain types of soil and slope may also have to be considered as well as grassed waterways and diversion ditches. In some areas, farming methods in use at present may also require modification. It is clear that any system which permits the exposure of uncovered fallow fields during the period of potential heavy rainfall is basically unsound and only serves to accelerate the rate of erosion. All forms of soil erosion preventive measures must be accompanied by good farming practices to achieve a full measure of success.

It is important to realize that although contour farming may materially reduce soil losses, the loss of soil with some soil types on certain slopes, even after the adoption of erosion control practices, may still be too great to maintain sustained agriculture. On most soils this seems to be particularly true where the grade of slopes is greater than 10 per cent. In other words it is highly probable that crop production on steeply sloping land subject to soil erosion will finally dwindle to an uneconomic level and the land will then be abandoned. Fortunately, cane itself is a soil-binding plant and the cane rotation requires only one seed bed preparation every four years on the average, hence this retrogression will be gradual and in some cases comparatively slow.

Overseas experience with a variety of crops other than sugar cane, particularly in the United States of America, has shown that the benefits to be gained from lands farmed according to suitable erosion practices include increased crop yields, conservation of moisture and reduction of soil losses. Furthermore, cultivation on the contour is easier and more efficient than up and down the slopes. As well as these advantages, the decreased expenditure in repairing fields also helps to offset the cost of installing erosion prevention measures. The benefits from soil erosion control practices may not be apparent immediately, especially on fields in which serious deterioration has not already occurred or in badly eroded fields where benefits may not show until a certain amount of soil building has been brought about. However, the answer to the question of whether economic gains can be achieved in Queensland cane fields will depend upon the solution of the problem of modifying and adapting known soil erosion control practices to work satisfactorily under the conditions of cane growing in areas of heavy to very heavy rainfall.

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The Department has on hand a supply of Hegari Sorghum seed which was received from America at the beginning of this year.

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PLANT PROTECTION

Lyctus (Powder Post) Beetles in Queensland Timbers.

By A. R. BRIMBLECOMBE, M.Sc., Entomologist.

THE increased demand for building material in Queensland has brought into prominence many additional timber species not formerly exploited because of their susceptibility to attacks by the powder post or Lyctus beetles.* For this reason, methods of immunizing such timbers against attacks by these borers have been closely studied in recent years. Considerable progress has been made, and one method of borer-proofing timber is now applied commercially in this State. However, much borer-susceptible timber is still being used for the construction of buildings and in the manufacture of furniture, tools and similar products, and it is therefore desirable that everyone involved in the handling and usage of timber should be acquainted with the powder post beetles and methods of preventing their damage.

Plate 57.
POWDER POST BEETLE × 12.

[*Drawings by William Manley.*
Plate 58.
POWDER POST BEETLE.—Larva or grub × 12.

Life History.

There are two powder post beetles in Queensland, one of which occurs throughout the State while the other is confined to northern

* *Lyctus brunneus* Steph. and *L. discedens* Blk.

Queensland. The habits of the two insects are similar, but the northern species is about half the size of the cosmopolitan and more common pest which is the principal one discussed in this article.

The powder post beetle is dark brown in colour, elongate in shape, and about one-fifth of an inch in length (Plate 57). During its life cycle it passes through four stages which are the egg, the larva or grub, the pupa and the adult beetle.

Plate 59.

Powder Post Beetle.—Infested timber showing emergence holes of the beetle.

The eggs are whitish in colour and cylindrical in shape, tapering into a thread at one end. They are laid into the pores of the wood, and under favourable conditions hatch in a period between one and two weeks. After emerging from the eggs, the grubs tunnel in the wood until they are full grown. At this stage they are slightly curved in shape, about one-quarter of an inch in length, and whitish in colour with a brownish head (Plate 58). The period required for their development varies according to the amount of suitable food available in the wood. Under some conditions this period might be as short as four months, while under less suitable conditions it might extend to ten months. However, in Queensland the grub-stage is usually completed in six to seven months. When the grub is full grown it normally approaches the surface of the wood and excavates a small oval cell where it sheds its skin and changes to the pupa. This resting stage covers about three weeks, during which internal changes occur in preparation for the final transformation to the adult beetle. After a few days the beetle chews its way to the surface. It is the emergence of beetles which causes the numerous small round holes on the surface of infested timber (Plate 59).

The powder post beetle may pass through two generations in a year. Beetles are most abundant during the spring and summer months but, due to overlapping of the generations, they can be found throughout the year. For this reason, infestation may begin at any time.

Habits of the Beetles.

The beetles emerge from the timber during the night, more particularly after dusk. They do not like light and when exposed in the daytime they crawl to shaded positions on the under sides of any

nearby objects, between boards, or into old emergence holes. Mating takes place soon after emergence, and during a life of several weeks the females lay eggs into the same or other timber. They can fly readily, and probably spread by this means.

Egglaying mainly occurs soon after dusk, although it can extend later into the night and sometimes may take place during the day in secluded positions. The ovipositor or egglaying tube is inserted into a pore in the wood, and thus the eggs are laid below the surface. Fifty eggs can be laid by each female. As many as eight eggs may be placed into one pore; however, the number usually varies from one to four. Pores opening on any surface are used whether it is longitudinal or transverse. Egglaying into cracks and crevices in the wood is extremely rare, but the eggs may be placed into pores on the cracked surfaces.

Plate 60.

POWDER POST BEETLE.—Infested timber with part of outer surface removed to show tunnels along the grain.

Habits of the Grubs.

Soon after hatching from the eggs, the grubs tunnel deeper into the wood. Tunnels are mostly along the grain (Plate 60), but their direction may vary according to the structural characteristics of the timber and the availability of food in the wood cells. Grubs of later generations tunnel wherever solid wood remains and thus the whole of the infested part is eventually reduced to powder (Plate 61). The fine debris in the tunnel is like flour and is packed behind the grub as it progresses through the wood. Sometimes, a tunnel may just break the surface of the wood or the wall of an adjacent tunnel leading to an emergence hole and the debris is then pushed to the exterior (Plate 62). The little heaps of powder which accumulate on the surface of infested wood or beneath it are often the first sign of Lyctus infestation.

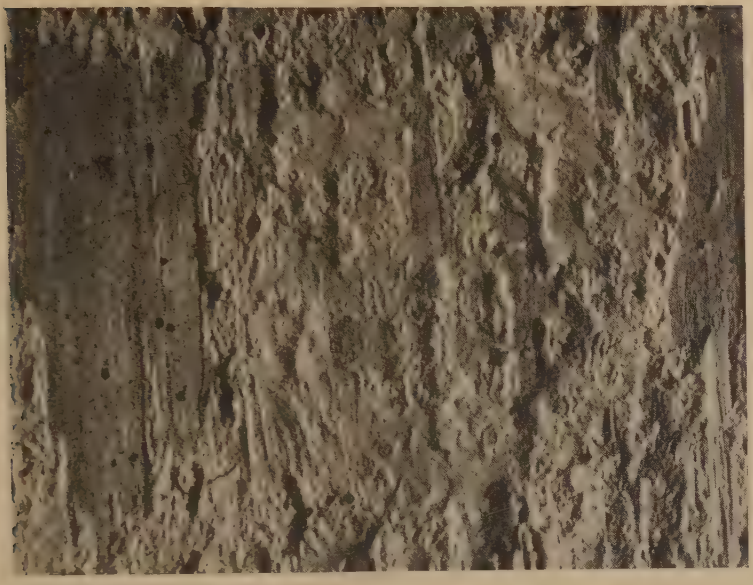

Plate 61.

Powder Post Beetle.—Infested timber with infested parts reduced to fine powder.

Plate 62.

Powder Post Beetle.—Infested timber showing borer dust on outside.

The Lyctus grubs have definite food preferences, chief among which is the starch located in the cells of the wood tissue. Eggs may be laid into wood containing little or no starch, but the young grubs die soon after hatching. As they tunnel, the grubs chew away the wood and although practically all of this is consumed, the starch is the main constituent extracted from it. When the starch content of the wood is high, numerous grubs may be working closely together and quickly become full grown; in timber with a low starch content, the grubs usually are less numerous and probably take much longer to reach maturity.

Plate 63.

POWDER POST BEETLE.—Emergence holes through pine veneer from infested core stock shown exposed on left.

Who Suffers from Lyctus Attacks?

Those who suffer most in Queensland from attacks by the powder post beetle are the owners of recently constructed homes. Loss may also be suffered by timber merchants, architects, builders, joiners, and other manufacturers or dealers, more particularly if stocks of timber or manufactured articles are held for some time.

Susceptible timber from Queensland scrubwoods may go straight from sawmills to homes or other buildings in course of erection. Within a year or two the owner may find borer dust coming from the timber or borer holes appearing in increasing numbers in various places (Plate 63), even through panelled or plaster walls. The treatment or replacement of damaged timber involves considerable trouble and expense.

What Makes Timber Susceptible to Lyctus?

The grub stage of the powder post beetle is responsible for the destruction of infested timber. The grubs tunnelling through the timber

subsist on starch stored in the wood as a food reserve for the growing tree. The amount of starch in the wood therefore is an important factor determining the risk of an attack and the severity of the damage.

Another important factor influencing Lyctus attacks is the size of the pores in the wood. The beetles do not lay their eggs indiscriminately but place them into pores in the wood. Provided the beetle can insert the ovipositor into a pore, eggs can be laid. For this reason, as a general rule, only those timbers with pores as large or larger than the size of the egglaying tube are attacked.

The two important factors influencing attacks therefore are starch content and pore size of the wood. If the starch content is negligible the wood is not attacked even though the pore size is favourable; conversely, if the pore size is too small no attack occurs even though the starch content may be high. Unfortunately, the majority of Queensland's timbers may contain abundant starch and possess comparatively large pores. Pine and other coniferous timbers do not possess pores and therefore are naturally immune to Lyctus attacks.

The northern powder post beetle is capable of attacking timbers with a pore size smaller than that required by the more common species. Consequently, the starch content of the wood is the predominantly important factor governing Lyctus attacks in northern Queensland.

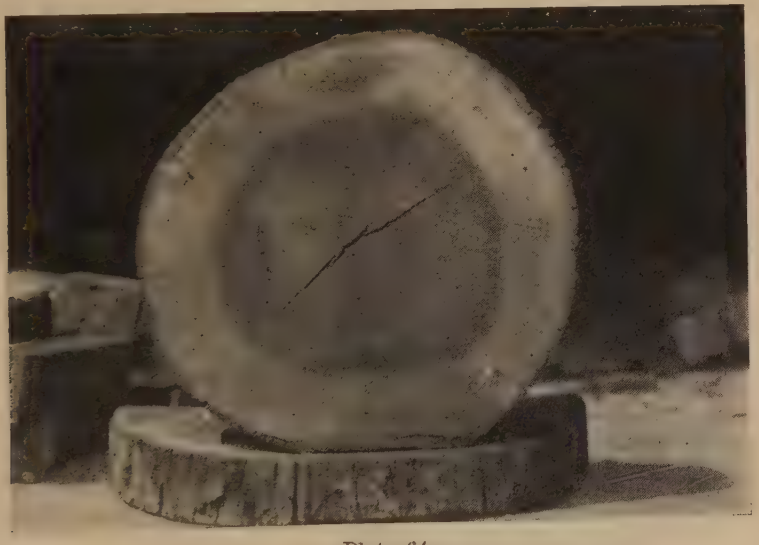

Plate 64.

Red Tulip Oak.—Log section showing band of sapwood and intermediate wood which are liable to attack by powder post beetles.

The Location of Starch in Timber.

The wood tissue of trees may be composed of two or three of the following types:—sapwood, intermediate wood, and truewood. Most trees, e.g. spotted gum, contain sapwood and truewood only. In these the food reserves, chief among which is starch, are stored in the sapwood which therefore is the tissue attacked by the Lyctus beetles. Some of the scrubwood species, e.g., red tulip oak (Plate 64), possess an intermediate wood as well as sapwood, the former being intermediate in position

and function between the sapwood and truewood. This tissue as well as the sapwood may contain starch and therefore is also liable to Lyctus attacks. For practical purposes the sapwood and intermediate wood may be regarded as outer and inner sapwood respectively and referred to collectively as sapwood. Truewood does not contain starch and consequently is not attacked by this insect.

After a tree of a susceptible species is felled and the cells in the wood tissue die, the starch content of the sapwood remains unchanged. Even when the log is sawn and the timber is air- or kiln-dried the starch is practically unaltered and the timber is still susceptible to attack.

The various species of trees may store starch in the sapwood in different amounts. Species which are heavily attacked by Lyctus can store abundant starch, and the amount may vary with the season.

Timbers Attacked.

As previously mentioned, the main condition favouring Lyctus attacks is the presence of sufficient starch in a wood with suitably sized pores. Many Queensland timbers meet this requirement and are therefore liable to attacks. However, some timbers, e.g., grey ironbark, normally do not possess sufficient starch, while in others, e.g., sassafras, the pores are too small. There are still others in which attacks do not occur although the starch content and pore size are suitable. The susceptible species are well known and these are listed in an appendix. It will be noted that no pine or other coniferous timbers are listed; all are immune to Lyctus attacks.

When is the Attack Started?

Lyctus beetles occur in practically every place where timber is being handled, more particularly in the forest, the mill yards, timber storage yards, factory premises, recently constructed buildings, or those in course of construction. Attacks can begin in any of these places, but they commonly commence on logs. They might not occur on green sapwood of freshly felled logs, but it is only a matter of a few days before exposed wood is suitable for egglaying. Consequently, timber cut from logs of susceptible species must be regarded with suspicion even though the logs may be milled soon after they are felled.

Because attacks can commence at practically any time and place under Queensland conditions, no one handling or using untreated timber can justly blame another person for any damage which might occur. However, it would be an advantage to all connected with the timber industry if timber was rendered immune to borer attacks at some stage before it is used in buildings, furniture or other manufactured products.

How to Determine What Timber should be Borer-proofed.

It need not be taken for granted that every piece of sapwood timber from Lyctus-susceptible species is threatened with borer attacks. Sometimes, due to climatic or other factors, the starch content of the tree is low when the tree is felled and may decline to the Lyctus-immunity level while the log is still green. Such occurrences are irregular, and therefore reliance cannot be placed on them, but advantage may be taken of them when they do occur. For this reason it might not be

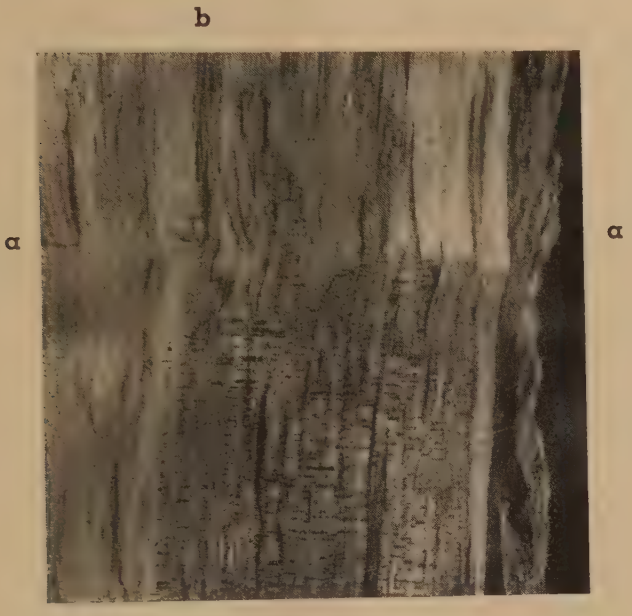

Plate 65.

Cut Surface of Lyctus-Susceptible Timber.—Above "a—a" iodine solution has not been applied; below "a—a," the wood is treated with iodine. Left of "b—b" is truewood; right of "b—b" is sapwood.

Plate 66.

Portions of Iodine-Treated Sapwood.—Enlarged to show the coloured starch.

necessary to borer-proof the sapwood of all logs of susceptible species, and a convenient test is available to determine what timber should be borer-proofed. It consists essentially of checking the starch content of the wood.

In many hardwoods, e.g., spotted gum, and in some scrubwoods the sapwood is readily distinguished from the truewood by its lighter colour. In a number of scrubwoods, e.g., white cheesewood, however, the light colour of the truewood makes it extremely difficult to demarcate the sapwood, more especially after the timber is sawn and seasoned. It is particularly in species such as these that the test for starch is essential. In fact, it is desirable that all susceptible species be tested for starch so as to take advantage of the fact that when little or no starch is present in the timber, borer-proofing treatment can be omitted.

Starch readily turns a blue-black colour when treated with a solution of iodine. For testing wood for starch, iodine solution is made by adding ¼ oz. of iodine crystals and ½ oz. of potassium iodide to 1 quart of water and vigorously shaking until both the chemicals are dissolved. The iodine solution corrodes metals and therefore should be kept in a glass container.

The starch test can be made on a clean, freshly cut surface of the log or the sawn timber. This should be done on a split, rather than on a sawn, surface and should include the whole depth of the sapwood. The bulk of the starch occurs in the medullary rays of the wood, and for this reason the cut must be made on the quarter or, in other words, on the radius of the log (Plates 65 and 66). The iodine solution is applied by a small atomizer or by a brush, and in a few minutes the starch shows up mostly as blue-black dotted lines. If no starch is present only the yellow colour of the iodine solution is shown. In this way it can be determined whether any timber from a log need be treated and if so how much or in the case of sawn timber what boards should be treated. At least two tests should be made on the end of a log, on opposite sides, preferably on both ends, and the extent of starch-bearing wood marked with a chalk, due allowance being made for bends or bows in the log. Tests on boards may be made on each end or two other suitable places.

When and Where should Timber be Borer-proofed?

In view of the fact that suitable methods of borer-proofing timber have now been worked out, Lyctus attacks should be prevented, as the eradication of the borers from infested timber is a costly operation. The damage occurs mostly after timber has been constructed into buildings or manufactured into furniture or other articles. The application of any borer-proofing treatment should therefore be made at some time prior to construction or manufacture. Treatment would be most conveniently and economically applied where timber is handled in bulk, e.g., at the mills. Therefore, there is an obligation on millers to undertake mass treatment of all susceptible timbers. In Queensland, borer-proofing plants are in operation at most plymills, while several plants at sawmills are already in operation and others will be constructed in the near future.

Methods of Borer-proofing Timber.

Boric Acid Bath Treatment.

Boric acid is the most suitable chemical for borer-proofing timber, for it does not involve any harmful effects to operators of treatment plants or users of treated timber.

Plants for treating veneers are located at most plymills in Queensland and have been in operation for many years. They consist of suitably sized copper-lined vats provided at the bottom with heating coils. Sufficient boric acid is added to water in the vat to give a 1·25 per cent. solution, and the whole is heated to about 205 deg. F. The ply sheets are stacked in cradles which are hoisted and then lowered into the vats by means of an overhead gantry. Thirty minutes soaking is sufficient time for the boric acid solution to completely penetrate the veneers and the treatment leaves about 0·2 per cent. by weight of the chemical in the wood, which is sufficient to prevent Lyctus infestation.

Plate 67.

Spotted Gum.—Showing the high ring which promotes starch depletion in the bole.

A more recent development is the boric acid treatment of sawn timber. Modern sawmills have kiln-drying plants and boric acid treatment vats can be made of sufficient size to accommodate a kiln-size stack of timber. These vats may be constructed in various ways, a common type being of reinforced concrete and lined with copper sheets, provided with heating coils and a moveable bulkhead to enable the stack

of timber to be placed in position. The most modern plant in Queensland operates two adjoining vats, which conserve solution and heat and save time. Generally, the strength of the boric acid solution for treating sawn timber should not be less than 2·0 per cent. Again the solution is heated to about 205 deg. F., but the timber should be held at this temperature for a period of from two to four hours, depending on the species and the thickness of the boards, and then for a further period until the temperature drops to about 150 deg. F. This cooling process draws the solution into the pores so that the required amount of boric acid is taken into the wood. Timber treated in this way is permanently immune to attacks by the powder post beetle. Treatment is at present limited to timber two inches or less in thickness, thicker timber being a more difficult problem. Detailed information on vat design and treatment schedules can be obtained from the Forestry Department.

Starch Depletion.

The boric acid treatment of sawn timber is regarded as the standard method of borer-proofing the sapwood of Lyctus-susceptible timbers. The same result can be obtained, however, in many cases by ringbarking the trees at the top of the commercial length of bole. This causes the starch in the sapwood to be used up before the trees are felled. Such a treatment has been successfully used on the eucalypts, spotted gum, lemon-scented gum and brown bloodwood, and possibly it would also be successful on other eucalypt or open-forest species (Plate 67). Adequate starch depletion has been obtained from high-ringing on a number of rain-forest timbers; but other problems, such as the marked variation in the rate of starch depletion from tree to tree, might make the treatment of these species impracticable. However, in the open forests where these problems do not arise, the treatment is recommended. With the three eucalypts mentioned, the sapwood of the treated trees becomes immune to Lyctus attacks between six to eight months after high-ringing and no further treatment after felling is required.

Methods of Temporary Protection.

Logs of susceptible species may be temporarily protected from attacks by the powder post beetle. Such protection is most desirable when mills build up reserves of logs to tide them over periods of wet weather. The logs should be removed from the forest to a central dump as soon after felling as practicable. Lyctus attacks can occur only on exposed sapwood surfaces, so as much bark as possible should remain intact. At the central dump, any injured bark should be cut away until the remainder is fresh and firm on the log. The log ends and all other exposed wood surfaces should then be sprayed with K55 creosote, equal parts of creosote and kerosene, or hot creosote emulsion (one part of K55 creosote with one or two parts of 5·0 per cent. hot soft soap solution). Finally, all the exposed wood surfaces should be sealed with crude petroleum jelly or some other suitable sealing material. The logs should then be stacked in tiers to reduce the rate of drying. This treatment has proved effective on logs stored for periods up to almost two years.

Temporary protection can also be given to sawn timber by dipping, spraying, or brushing it with one or other of the solutions mentioned above, but the trouble involved is worth while only in small scale operations.

Methods of Arresting Attacks.

Because of the small number of boric acid treatment plants as yet in operation in Queensland, Lyctus-susceptible timber is still being used in large quantities for the construction of buildings and furniture. Borer attacks frequently occur in such timber if it has been held in stock for some time or after it is used for constructional or manufacturing purposes. There is therefore still a need for methods of arresting attacks when they do occur. Often the pest cannot be eradicated from infested timber without considerable trouble and expense, and purchase of non-susceptible or borer-proofed timber in the first place is the only real solution to the problem.

The most satisfactory method of treating infested sawn timber or manufactured articles is sterilization by heat in a seasoning kiln. The temperature of the kiln should be at least 130 deg. F. and the humidity not lower than 80 per cent. After allowing a sufficient time for this temperature to reach the centre of the wood (the period depending on the thickness), the timber should be held in the kiln for two hours. Heat treatment is sterilization only; it does not confer immunity from further attacks.

The most difficult problem is to arrest infestations occurring in the timber of buildings already constructed. Frequently they are in hidden places, while sometimes the choice of chemical to be used is rather limited. Timbers with a large cross-section, such as bearers, cannot as yet be borer-proofed by the boric acid treatment. However, existing standards limit the amount of sapwood on these, and even if Lyctus attacks occur the stability of the building is not affected. If the infestation in the smaller sizes of timber is heavy, replacement should be undertaken where possible; otherwise, the wood can be thoroughly brushed or sprayed with K55 creosote. Often the attacks occur in places such as in painted or polished walls, or in furniture, where the use of creosote is undesirable. In such cases paradichlorobenzene dissolved in kerosene (1 lb. to 1 gallon) or equal parts of turpentine and kerosene may be injected into the borer holes on the surface, any surplus liquid being wiped away. This treatment is localized to the holes already showing and cannot be expected to be completely effective with one treatment. In fact, the eradication of this borer from infested timber or furniture by spraying, brushing or localized injections frequently necessitates a number of treatments which are applied when fresh borer dust is observed or new holes appear.

Appendix.

QUEENSLAND COMMERCIAL TIMBER SPECIES SUSCEPTIBLE TO LYCTUS ATTACKS.

(Standard names in CAPITAL letters.)

Trade Reference Name.	Common Name.
ACACIA BAKERI	White marblewood
ACACIA HARPOPHYLLA	BRIGALOW
AILANTHUS IMBERBIFLORA ..	WHITE SIRUS
ALBIZZIA TOONA	RED SIRUS
ALBIZZIA XANTHOXYLON ..	YELLOW SIRUS
ALEURITES MOLUCCANA	CANDLENUT
ALSTONIA SCHOLARIS	WHITE CHEESEWOOD
Amoora nitidula	Incense wood
ANGOPHORA INTERMEDIA	ROUGH-BARKED APPLE

Appendix—*continued.*

QUEENSLAND COMMERCIAL TIMBER SPECIES SUSCEPTIBLE TO LYCTUS ATTACKS—*continued.*

(Standard names in CAPITAL letters.)

Trade Reference Name.	Common Name.
ANGOPHORA LANCEOLATA	SMOOTH-BARKED APPLE
ANGOPHORA SUBVELUTINA	Broad-leafed apple
APHANANTHE PHILIPPINENSIS	GREY HANDLEWOOD
Aryteria distylis	Silver cornelwood
BALOGHIA LUCIDA	IVORY BIRCH
BANKSIA INTEGRIFOLIA	WHITE BANKSIA
BEILSCHMIEDIA BANCROFTII	YELLOW WALNUT
BEILSCHMIEDIA OBTUSIFOLIA	BLUSH WALNUT
BLEPHAROCARYA INVOLUCRIGERA	ROSE BUTTERNUT
BURSERA AUSTRALASICA	BROWN CUDGERIE
CARDWELLIA SUBLIMUS	NORTHERN SILKY OAK
CASTANOSPERMUM AUSTRALE	BLACK BEAN
CEDRELA TOONA	RED CEDAR
Celtis paniculata	Silky Celtis
CINNAMOMUM LAUBATII	PEPPERWOOD
CINNAMOMUM OLIVERI	CAMPHORWOOD
CRYPTOCARYA ERYTHROXYLON	ROSE MAPLE
CRYPTOCARYA OBLATA	BOLLY SILKWOOD
CRYPTOCARYA OBOVATA	WHITE WALNUT
DIOSPYROS PENTAMERA	GREY PERSIMMON
DIPLOGLOTTIS CUNNINGHAMII	TAMARIND
Dysoxylum cerebriforme	Northern red bean
DYSOXLYUM FRASERANUM	ROSE MAHOGANY
DYSOXYLUM MUELLERI	MIVA MAHOGANY
DYSOXLYUM PETTIGREWIANUM	SPUR MAHOGANY
Dysoxylum rufum	Stinkwood
EHRETIA ACUMINATA	SILKY ASH
ELAEOCARPUS GRANDIS	SILVER QUANDONG
EMBOTHRIUM WICKHAMI	SATIN OAK
ENDIANDRA COMPRESSA	QUEENSLAND GREENHEART
ENDIANDRA DISCOLOR	ROSE WALNUT
ENDIANDRA PALMERSTONI	QUEENSLAND WALNUT
ENDIANDRA SIEBERI	PINK WALNUT
ENDIANDRA VIRENS	N.S.W. WALNUT
ERYTHRINA VESPERTILIO	GREY CORKWOOD
ERYTHROPHLOEUM LABOUCHERII	Cooktown ironwood
EUCALYPTUS ANDREWSI	NEW ENGLAND ASH
EUCALYPTUS CORYMBOSA	RED BLOODWOOD
EUCALYPTUS MACULATA	SPOTTED GUM
EUCALYPTUS MICROCORYS	TALLOWWOOD
EUCALYPTUS PUNCTATA	GREY GUM
EUCALYPTUS RESINIFERA	RED MAHOGANY
EUCALYPTUS ROBUSTA	SWAMP MAHOGANY
EUCALYPTUS SALIGNA	SYDNEY BLUE GUM
EUCALYPTUS TESSELLARIS	CARBEEN
EUCALYPTUS TRACHYPHLOIA	BROWN BLOODWOOD
Eugenia brachyandra	Red apple
Eugenia cormiflora	Onionwood
Eugenia corynantha	Sour cherry
EUGENIA GUSTAVIOIDES	GREY SATINASH
EUGENIA HEMILAMPRA	White eungella gum
Eugenia myrtifolia	Creek cherry
EUROSCHINUS FALCATUS	PINK POPLAR
Excaecaria dallachyana	Scrub poison tree
Ficus cunninghami	Small-leaf fig
Ficus glomerata	Cluster fig
Ficus macrophylla	Moreton Bay fig
Ficus stephanocarpa	Sandpaper fig

Appendix—*continued.*

QUEENSLAND COMMERCIAL TIMBER SPECIES SUSCEPTIBLE TO LYCTUS ATTACKS—*continued.*

(Standard names in CAPITAL letters.)

Trade Reference Name.	Common Name.
FLINDERSIA ACUMINATA	SILVER SILKWOOD
FLINDERSIA AUSTRALIS	CROW'S ASH
FLINDERSIA BENNETTIANA ..	BENNETT'S ASH
FLINDERSIA BOURJOTIANA ..	QUEENSLAND SILVER ASH
FLINDERSIA COLLINA	Leopard ash
FLINDERSIA IFFLAIANA	HICKORY ASH
FLINDERSIA OXLEYANA	YELLOWWOOD
FLINDERSIA PUBESCENS	NORTHERN SILVER ASH
FLINDERSIA SCHOTTIANA	SOUTHERN SILVER ASH
GEIJERA SALICIFOLIA	Green satinheart
GEISSOIS LACHNOCARPA	MARARIE
GREVILLEA ROBUSTA	SOUTHERN SILKY OAK
Helicia ferruginea	A silky oak
Hemicyclia australasica	Grey boxwood
Jagera pseudorhus	Foambark
Litsea dealbata	A bollygum
LITSEA RETICULATA	BOLLYWOOD
LUCUMA GALACTOXYLON	RED SILKWOOD
MALLOTIS PHILIPPINENSIS ..	Kamela
MELIA DUBIA	WHITE CEDAR
PANAX ELEGANS	SILVER BASSWOOD
PLEIOGYNIUM SOLANDRI	TULIP PLUM
PITTOSPORUM RHOMBIFOLIUM ..	WHITE HOLLY
PSEUDOMORUS BRUNONIANA ..	WHITE HANDLEWOOD
RHODOSPHAERA RHODANTHEMA	TULIP SATIN WOOD
SARCOCEPHALUS CORDATUS ..	CHEESEWOOD
SCHIZOMERIA OVATA	WHITE BIRCH
SIDEROXYLON AUSTRALE	BLACK APPLE
SIDEROXYLON POHLMANNIANUM	YELLOW BOXWOOD
SIDEROXYLON RICHARDI	BLUSH COONDOO
SIPHONODON AUSTRALE	IVORYWOOD
SLOANEA AUSTRALIS	BLUSH ALDER
Sloanea langii	Northern blush alder
SLOANEA WOOLLSII	YELLOW CARABEEN
STENOCARPUS SALIGNUS	RED SILKY OAK
STENOCARPUS SINUATUS	WHITE OAK
STERCULIA ACERIFOLIA	Flame kurrajong
Sterculia discolor	White kurrajong
STERCULIA DIVERSIFOLIA	KURRAJONG
Synoum glandulosum	Red sycamore
TARRIETIA ACTINOPHYLLA ..	BLUSH TULIP OAK
TARRIETIA ARGYRODENDRON ..	BROWN TULIP OAK
TARRIETIA PERALATA	RED TULIP OAK
Terminalia sericocarpa	Sovereignwood
Xanthophyllum macintyrei	False saffronheart

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Larger Horned Citrus Bug Control with D.D.T.

A. W. S. MAY, Assistant Entomologist.

THE larger-horned citrus bug* is a common pest in a number of important citrus districts in Queensland. Although losses from this pest may be experienced in certain coastal orchards in dry years, the bug is normally restricted to sub-coastal and inland areas where damage is a yearly phenomenon. Of the cultivated citrus varieties, lemons are most subject to attack, although mandarins are frequently infested. In uncontrolled infestations, all varieties may be attacked.

Fumigation and hand-picking are recognized methods of control, but the timing of fumigation in the pest and disease control programme is dictated by the well-defined migration periods of the bug, by the scale insect position and the presence or otherwise of spray residues on the foliage and fruits. In addition, suitable weather conditions are required for its application. Recently, extensive laboratory and field experiments with D.D.T. have shown that this insecticide is very effective against the larger horned citrus bug. The exacting and laborious technique necessary to control this pest by fumigation is thus obviated and orchardists now have an alternative, efficient and easily applied control measure at their disposal.

Advantages of D.D.T.

The egg stage of the bug is resistant to fumigation which must therefore be applied after migration ceases but before egg laying takes place. Rarely is such exact timing possible, and invariably a second fumigation is necessary to kill nymphs arising from eggs that survived the initial treatment. The use of D.D.T. overcomes this difficulty, for although eggs present at the time of spraying will continue to develop and hatch normally, the newly emerged nymphs are killed once they walk over the spray residue on the tree. This residual effect of D.D.T. lasts up to fourteen days in the case of 0·2 per cent. sprays. When the spray is used at this concentration, all nymphal stages and adults that are wetted when the spray is applied die. In addition those individuals that escape the initial treatment are killed when they come in contact with sprayed surfaces on the tree. Further, migrating adults arriving in the orchard and settling on sprayed trees within two weeks of the spray application fail to survive.

The efficiency of D.D.T. enables it to be used on a less exacting schedule than fumigation. Consequently, the spray may be applied by the orchardist whenever the bugs are present on the trees in troublesome numbers.

Orchard Recommendations.

The orchardist has many proprietary brands of D.D.T. at his disposal. However, these contain D.D.T. in various amounts and, after selecting a product suitable for use on plants, the grower must follow

* *Biprorulus bibax* Bredd.

closely the manufacturer's directions when mixing the spray. The percentage of D.D.T. in the spray will depend to a certain extent on the degree of bug infestation, the variety of citrus to be treated and its liability to reinfestation, and the possibility that migration into the orchard may continue after the spray is applied.

A spray containing 0·2 per cent. D.D.T. has, as stated above, a definite residual effect and is recommended for bug control in lemons and those varieties of mandarins that are subject to reinfestation. Although a D.D.T. spray is less costly than fumigation for bug control, the economical use of materials is a necessary consideration. At the 0·2 per cent. level, only sufficient spray need be applied to wet the greater part of the foliage and twigs. This would require about one gallon of spray for each tree in full bearing if a fine nozzle giving a mist spray is used. The residual effect of such a spray will compensate for the incomplete coverage.

In the case of an 0·1 per cent. D.D.T. spray, double the quantity of spray would have to be applied to give a D.D.T. load per tree comparable with the 0·2 per cent. spray, but in this instance the spray run-off may be high and the residual effect may be less than that required. However, where only a contact spray is needed and residual effects are unimportant, a concentration of 0·1 per cent. may prove satisfactory.

Spray applications will probably be needed in each of the three well-defined bug migration periods in spring, early summer, and mid-summer. The actual time of spray application will depend largely on the bug position in the orchard, although consideration should also be given to the combination of D.D.T. with other sprays used in routine pest and disease control measures.

Apart from showing no interaction with existing spray residues on the trees when the spray is applied, D.D.T. can be combined with certain other spray materials. Since complete coverage is essential with white oil and copper sprays, relatively large amounts of spray are used per tree, hence the advisability of adding D.D.T. to either must be considered on a cost basis. It will probably be more economical to apply D.D.T. by itself as a partial cover spray than to prepare a combination spray containing D.D.T. and white oil or D.D.T. and a copper fungicide.

D.D.T. and Maori Mite.

Experimental evidence has been obtained that mites are not controlled by the concentrations of D.D.T. used on citrus, and Maori mite populations may increase considerably following applications of this spray in summer. Fumigation has a controlling influence on mite populations and if it is omitted from the scale control programme an additional spray for the control of Maori mite will be needed. An early summer lime-sulphur spray, at 1 : 35 strength, for Maori mite control should be an essential part of any orchard spraying programme. An additional treatment for mite control, preferably wettable sulphur if temperatures at the time are too high for the safe use of lime-sulphur, is recommended during mid- or late summer. This spray would either follow the D.D.T. spray applied in midsummer for bug control or be used with it in a combined spray if the available D.D.T. can be safely added to wettable sulphur or lime-sulphur.

Plate 68.

Front Row (Left to Right)—Messrs. D. O. Atherton, Assistant Director of Agriculture; C. J. McKeon, Director of Agriculture; W. T. Gettons, Assistant Under Secretary, Adm.; A. F. Bell, Under Secretary; Hon. H. H. Collins, Minister for Agriculture and Stock; R. Veitch, Assistant Under Secretary, Tech.; Dr. W. A. T. Summerville, Director, Plant Industry; W. G. Wells, Director, Regional Experiment Stations; C. S. Clydesdale, Senior Adviser in Agriculture; and J. A. Kerr, Senior Adviser in Agriculture.

Centre Row (Left to Right)—Messrs. G. Rasmussen, J. A. Mobbs, S. E. Stephens, L. G. Trim, K. G. Fisher-Webster, A. J. Crocker, W. G. Ferguson, R. W. George, N. E. Goodchild, and K. V. Henderson.

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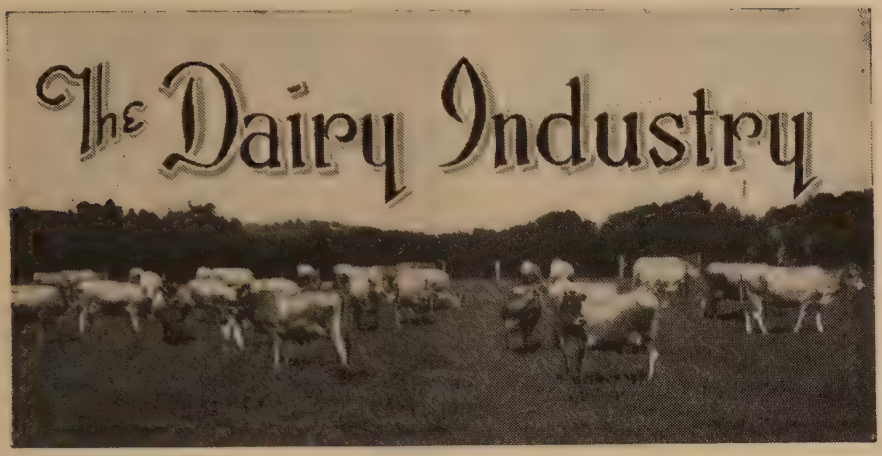

The Cleansing of Milking Machines.

THE DILUTE CAUSTIC SODA SOLUTION METHOD.

DIVISION OF DAIRYING.

THE successful operation of a milking machine depends on the care and time given to it. Any neglect in keeping it clean will be reflected in the quality of the milk or cream supplied to the factory. The boiling water and caustic soda method has proved efficient for the cleansing of the milking machine, and in order that the method may be simply yet thoroughly applied the following are essentials:—

(1) An adequate supply of pure water.

(2) A steam sterilizer for boiling water and providing steam.

(3) Caustic soda. (Approved proprietary cleansers may be used in place of caustic soda.)

(4) A complete set of brushes for cleaning all parts of the machine.

To simplify this method, a routine system should be adopted, and the following has been found satisfactory in actual practice:—

Treatment Before Use.

Just before milking, give the machine (and all utensils) a cold water rinse to which a chlorine compound (used in accordance with instructions on the label) has been added (chlorine is not a cleanser, but a germicide). The used chlorine solution may be retained for washing udders, also floors and for similar purposes.

Treatment After Use.

Milk System.

1. Immediately after each milking wash all dirt from the exterior of the rubbers and teat cups, using a vessel and brush kept exclusively for this purpose.

2. Draw 1 gallon of cold water through each set of teat cups; while doing this, withdraw the cups from the water several times, thereby

causing a surging effect which flushes the pipes and rubbers more thoroughly, and facilitating more effective removal of milk residues than a steady flow. Always start on the set of teat cups farthest away from, and work towards, the releaser.

3. Draw through each set of teat cups at least 1 gallon of hot dilute caustic soda solution, which is made by dissolving 1 level dessertspoonful of caustic soda in 4 gallons of hot water. (Proprietary cleansers may be used instead of caustic soda, and, if so, use them according to the instructions on the label of the package.) While drawing the hot caustic soda solution through the teat cups nearest the releaser, the torpedo brush supplied with the machine, a ball of horsehair or a piece of cloth of unfraying quality is run through the milk pipe. The vacuum will carry this through with sufficient momentum to remove traces of milk from the interior of the pipe. If a torpedo brush is used the attached cord should be just long enough to enable the brush to travel the full length of the milk line, but not so long as to allow it to hit against and damage the metal of the releaser. Retain the caustic soda solution for using on the air line.

4. Next flush the whole of the milk system with clean, *boiling* water, using at least one gallon (preferably two) per unit, in order to remove all traces of the soda solution. This is important, for if the caustic soda solution is not rinsed off with plain water the tinning will gradually be removed from the milk pipes.

5. After this has been done, sterilize the entire milk system with steam, but it should always be remembered that the efficiency of steam sterilization depends on the effectiveness of the prior cleansing operations. If steam is applied to the machine before thorough cleansing, the heat will bake the milk remnants on to the interior of the pipes. This residue forms a hard deposit, known as milkstone, which makes cleansing and near sterilization difficult.

Air System.

Cleanse the air line at least once daily by flushing with hot soda solution, followed by clean, hot water. (The soda solution and hot water previously used for the milk lines may be used.) Because of the differences in the way of cleaning the airline of different machines, the manufacturer's instructions should be carefully followed. In the event of a farmer not knowing how to clean the airline of his machine, he is advised to contact the manufacturer or the local Dairy Officer.

N.B.—It is important to thoroughly cleanse at each milking the rubber connection from the bottom chamber of the releaser attached to the pulsation system.

Sundries.

After all operations have been completed, dismantle the releaser, thoroughly cleanse, and sterilize with steam. Then remove the vacuum tank, cleanse, sterilize, and store both it and the releaser in some dust-free position.

Take the teat cup assembly and long rubbers off the down drops, and hang in a cool place. Remove all rubber plugs, or throw open flaps.

After each milking, remove the glass observation bowls and rubber washers under them and place in a position to dry.

Weekly Dismantling of Machine.

At least once a week completely dismantle and clean the machine. Take down the observation bowls, rubber washers, teat cups, claws, air and milk droppers and top rubbers; in fact, every part of the plant that will come asunder, and throughly wash inside and out with hot soda solution, then boiling water, and finally sterilize with steam.

At least once a week place all rubberware in a bag, suspend in water to which has been added one level tablespoonful of caustic soda to 4 gallons of water, and boil for ten minutes. This prolongs the life of rubberware.

Summary.

Summarised, the procedure in the cleaning of machines by the dilute caustic soda solution method is:

(1) Just before each milking flush the milk system with clean, cold water containing a chlorine compound in the proportion indicated by the manufacturer.

(2) After use, rinse each unit with at least 1 gallon of cold water.

(3) Run through the milk system a hot, dilute caustic soda solution (1 level dessertspoonful of caustic soda to 4 gallons of hot water), using 1 gallon of the solution to each set of teat cups.

(4) Run plain *boiling* water through each set of teat cups, using at least 1 gallon (preferably 2) of boiling water for each unit.

(5) Sterilize the milk system with steam.

(6) Once daily thoroughly cleanse the air lines.

(7) Remove and dismantle the releaser and vacuum tank, wash each thoroughly, sterilize with steam and store in a dust-free place.

(8) Disconnect teat cups and all rubbers. Open up all flaps or remove rubber plugs on the machine.

(9) At least once a week completely dismantle the machine and thoroughly cleanse and sterilize it.

BROOM MILLET SEED FOR SALE.

To growers desirous of obtaining a pure and reliable strain of White Italian Broom Millet seed, the Department is offering a limited supply of seed raised from a specially selected strain.

Applications for seed, with accompanying remittance, should be addressed to—

The Under Secretary,
Department of Agriculture and Stock,
BRISBANE.

Postal address and name of railway station should be given.

PRICE.—The seed is being retailed at 6d. per lb. freight paid to purchaser's nearest railway station.

PRODUCTION RECORDING.

List of cows and heifers officially tested by Officers of the Department of Agriculture and Stock, which qualified for entry into the Advanced Register of the A.I.S., Jersey and Guernsey Societies' Herd Books, production records for which have been compiled during the month of July, 1947. (273 days unless otherwise stated.)

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
AUSTRALIAN ILLAWARRA SHORTHORN.				
JUNIOR, 4 YEARS (STANDARD 310 LB.)				
Yarranvale Annabelle	W. Henschell, Yarranlea	8,933·2	360·593	Trevor Hill Vosca
SENIOR, 3 YEARS (STANDARD 290 LB.)				
Mountain Home Gem 56th	M. C. Lester, Glengallon	10,558.7	389.769	Fairvale Ensign
JUNIOR, 2 YEARS (STANDARD 230 LB.)				
Jamberoo Buttercup 6th	A. F. Ezzy, Milmerran	6,932·5	269·614	Murray's Bridge Florrie's Prince
JERSEY.				
MATURE COW (STANDARD 350 LB.)				
Gem May	W. Bishop, Kenmore	11,557·4	692·354	Ardroy Lace's Volunteer
Gem Lula	W. Bishop, Kenmore	8,030·00	434·007	Bulby Oxford Gamboge
Balwyn Ginger Lass	R. J. Browne, Yangan	7,295·5	415·498	Oxford Darby
JUNIOR, 4 YEARS (STANDARD 310 LB.)				
Gem Mab	W. Bishop, Kenmore	7,646·6	417·632	Bulby Oxford Gamboge
Navua Elfa Victorine	C. A. Edwards, Alderley	7,614·99	366·246	Navua Victoire's Ruler
SENIOR, 3 YEARS (STANDARD 290 LB.)				
Trecarne Jersey Hope 2nd	J. J. Ahern, Conondale	7,164·75	414·694	Trecarne Some Suke
JUNIOR, 3 YEARS (STANDARD 270 LB.)				
Carnation Hope's Hazel	W. Spresser and Sons, Ipswich	7,030·5	350·643	Trecarne Victor 2nd
Pinegrove Betty	J. W. Evans, Rosewood	5,703·85	317·287	Glenview Victor
SENIOR, 2 YEARS (STANDARD 250 LB.)				
Trinity Cute Daffodil 2nd	J. S. McCarthy, Greenmount	6,486·5	310·079	Samares Cute Prince 3rd

JUNIOR, 2 YEARS (STANDARD 230 LB.)

Nairfale Lena	R. J. Browne, Yangan	7,055·4	356·619	Nairfale Golden Reality
Gem Ingrid	W. Bishop, Kenmore	6,617·45	348·785	Bulby Oxford Gamboge
Brookland Merry Prudence	W. S. Conochie, Sherwood	6,707·95	345·969	Bulby Maria's Keepsake
Gem Isobel	W. Bishop, Kenmore	5,806·45	341·88	Gem Valour
Nairfale Trinket	R. J. Browne, Yangan	6,231·2	332·287	Nairfale Count Prominence
Brook Lodge Amethyst	J. J. Ahern, Conondale	6,364·25	313·068	Trinity Mighty Prince
Trinity Hopeful Treasure	J. J. Ahern, Conondale	5,870·1	283·988	Trinity Crowning Effort
Brooklodge Sweet	J. J. Ahern, Conondale	5,234·95	270·642	Trinity Mighty Prince
Carnation Hope's Hazelette	W. Spresser and Sons, Ipswich	5,297·65	267·997	Bellgarth Glory King 2nd
Romsey Prim Pixie	J. Wilton, Killarney	4,814·7	261·135	Oxford Pixie's Victor
Carnation Model 2nd	W. Spresser and Sons, Ipswich	5,233·7	260·197	Bellgarth Glory King 2nd
Pinegrove Sunshine	J. W. Evans, Rosewood	4,309·7	256·766	Roseview Peer
Hopewell Sunflower	G. Harley, Childers	5,358·2	256·408	Trinity Daffodil's Design
Pinegrove Lucy	J. W. Evans, Rosewood	4,858·7	248·443	Roseview Peer
Carnation Joy	W. Spresser and Sons, Ipswich	4,884·55	247·77	Rosslyn Royal Trigger
Trecarne Some Eileen 2nd	T. A. Petherick, Lockyer	5,102·55	244·355	Trecarne Ruler 2nd

GUERNSEY.

JUNIOR, 2 YEARS (STANDARD 230 LB.)

Laureldale Pet	W. A. K. Cooke, Witta	6,325·9	319·431	Minnamurra Topsy's Sequel 2nd

Export Baconer Pigs.

BRISBANE ROYAL NATIONAL SHOW, 1947.

F. BOSTOCK, Officer-in-Charge, Pig Branch.

CONTINUING the policy of offering encouragement to pig raisers to produce the most desirable class of export baconer pigs, the Royal National Agricultural and Industrial Society at its 1947 Exhibition again provided a class for these pigs, conditions being similar to those of last year; however, a recommendation is to be made to the Society by the Australian Pig Society that exhibitors in future be allowed to dispose of the pigs entered in commercial classes in whatever manner they choose, and not necessarily slaughtered, as under the present rules.

Prize money of £40 was provided for this class, of which £25 was presented by the Department of Agriculture and Stock, in addition to £4 4s. by the Australian Pig Society, Queensland Branch, and £3 3s. by the Queensland Co-operative Bacon Association Ltd.

Each entry consisted of three baconer pigs, either pure bred or sired by a pure-bred boar, and each pig between 180 lb. and 220 lb. live weight.

Five entries were submitted and weighed under supervision of the stewards at 2 p.m. on Friday, 8th August, 1947, the middle-weight pig from each entry being selected for slaughter and forwarded to the Brisbane Abattoir immediately after live judging was completed by Mr. C. Shelton, who used a score card which provided 45 points for condition, 45 points for uniformity to type, and 10 points for general appearance.

The pigs were slaughtered at the abattoir, and after being chilled were judged by Mr. F. Bostock, judging being based on the system of carcass judging evolved in England and known as the Hammond system.

A feature of the competition was that the live judging corresponded with the carcass awards in respect to the first three placings, the only variation being that fourth and fifth in the live judging were fifth and fourth when the allotted points to carcass judging were added.

The pigs when judged alive were particularly good, no pen scoring below 90 points, and only 6 points separating the first and last pen.

In the carcass appraisal, eye muscle development was good in the first prize, but only fair to good in the remainder.

Backfat was good in the second, third, and fourth prizes; however, the first prize did not carry a sufficient proportion and the fifth prize was a little overfat.

Body length, a very important section of carcass judging, was disappointing, and although the carcasses appeared to have plenty of length overall, indications were that the lengths of middles were short in comparison to forequarters and when compared with the standard as set down by the judging system used, the highest points scored being 13 points out of a possible 20 points.

Considerably more attention should be given to this most important feature.

Leg length, which gives an indication of bone development, was good in all except one case, when only one point was scored out of a maximum of five points.

Breeders are urged to give this class special attention, and now that it has been recommended that pigs in commercial sections need not necessarily be slaughtered it is hoped that at next year's Exhibition not only white pigs will be exhibited but that representatives of all breeds will be shown, because the information gained by a study of the points allotted are of immense value and indicate to farmers the class of carcass required for the export market and the type of animal that will produce such a carcass.

The marks awarded each section, both for live judging and carcass appraisal, are given in detail in the accompanying tables, this affording an excellent means of comparison of each feature.

Illustrations of one side with the sections of the opposite side cut at the last rib afford another means of comparison and provide information of value to interested farmers.

Plate 69.

446—FIRST PRIZE.—LARGE WHITE × BERKSHIRE.
Exhibited by Messrs. H. J. Franke and Sons.

Plate 70.

447—Second Prize.—Large White × Large White.
Exhibited by Mr. K. B. Jones.

Plate 71.

448—THIRD PRIZE.—LARGE WHITE × LARGE WHITE.
Exhibited by Mr. N. E. Meyers.

Plate 72.

449—Fourth Prize.—Large White × Large White.
Exhibited by the Q.A.H.S. and College.

Plate 73.

445—FIFTH PRIZE.—LARGE WHITE × LARGE WHITE.
Exhibited by Messrs. T. Bradshaw and Son.

DETAILED RESULTS OF "SPECIAL EXPORT BACONER PIGS" COMPETITION, ROYAL NATIONAL SHOW, 1947.

Middle Weight Pig Appraised at the Brisbane Abattoir

Weight Range 180–220 lb.	Points for Live Pig																					
No. of Entry	Live Weight	Dressed Weight	Per cent. loss in dressing	Condition	Uniformity and Type	General Appearance	Total	Skin	Firmness of Fat	Hams	Shoulders	Streak	Total	Eye Muscle	Back Fat	Body Length	Leg Length	Total	Total Appraisal Points	Grand Total	Award Aggregate
				45	45	10	100	5	10	8	7	12	42	28	20	20	5	73	115	215	
445	196	154	21·42	42	41	8	91	4½	9½	7	6	9½	36½	44 mm. ·18	28 mm. 10	733 mm. 2	562 mm. 5	35	71½	162½	Fifth place 75·58%
446	214	174	18·69	43	44	9	96	5	9½	6½	6½	10	37½	50 mm. 23	18 mm. 15	822 mm. 11	599 mm. 4	53	90½	186½	First place 86·74%
447	196	143	27·00	43	43	9	95	4½	9	6	6	10	35½	39 mm. 13	19 mm. 19	772 mm. 13	565 mm. 4	49	84½	179½	Second place 83·48%
448	187	152	18·71	42	41	9	92	4½	9	6	6½	10	36	45 mm. 19	20 mm. 19	752 mm. 5	560 mm. 5	48	84	176	Third place 81·86%
449	202	148	26·73	41	41	8	90	4½	9	6	6½	10½	36½	40 mm. 14	22 mm. 18	760 mm. 9	595 mm. 1	42	78½	168½	Fourth place 78·37%

The 1947 Brisbane Exhibition.

Plate 74.

HIS EXCELLENCY THE GOVERNOR, LIEUTENANT-GENERAL SIR JOHN DUDLEY LAVARACK, K.B.E., C.B., C.M.G., D.S.O., AND LADY LAVARACK, ON THEIR ARRIVAL, WERE RECEIVED BY THE PREMIER, HON. EDWARD M. HANLON, M.L.A.

Plate 75.

THE GOVERNOR OF QUEENSLAND, LIEUTENANT-GENERAL SIR JOHN DUDLEY LAVARACK, OPENING THE 1947 BRISBANE EXHIBITION. SEATED ON THE DAIS (RIGHT) IS THE PREMIER OF QUEENSLAND, HON. EDWARD M. HANLON.

Plate 76.

Brisbane Exhibition, 1947.—Section of the Pedigreed Stock Parade.

Plate 77.

THE WINNING DISTRICT EXHIBIT.

Plate 78.
A Winning Fruit Display.

Plate 79.

ENTRANCE TO THE COURT OF THE DEPARTMENT OF AGRICULTURE BEFORE THE CROWD CAME.

Plate 80.

THE SERVICE OF SCIENCE TO RURAL INDUSTRIES.

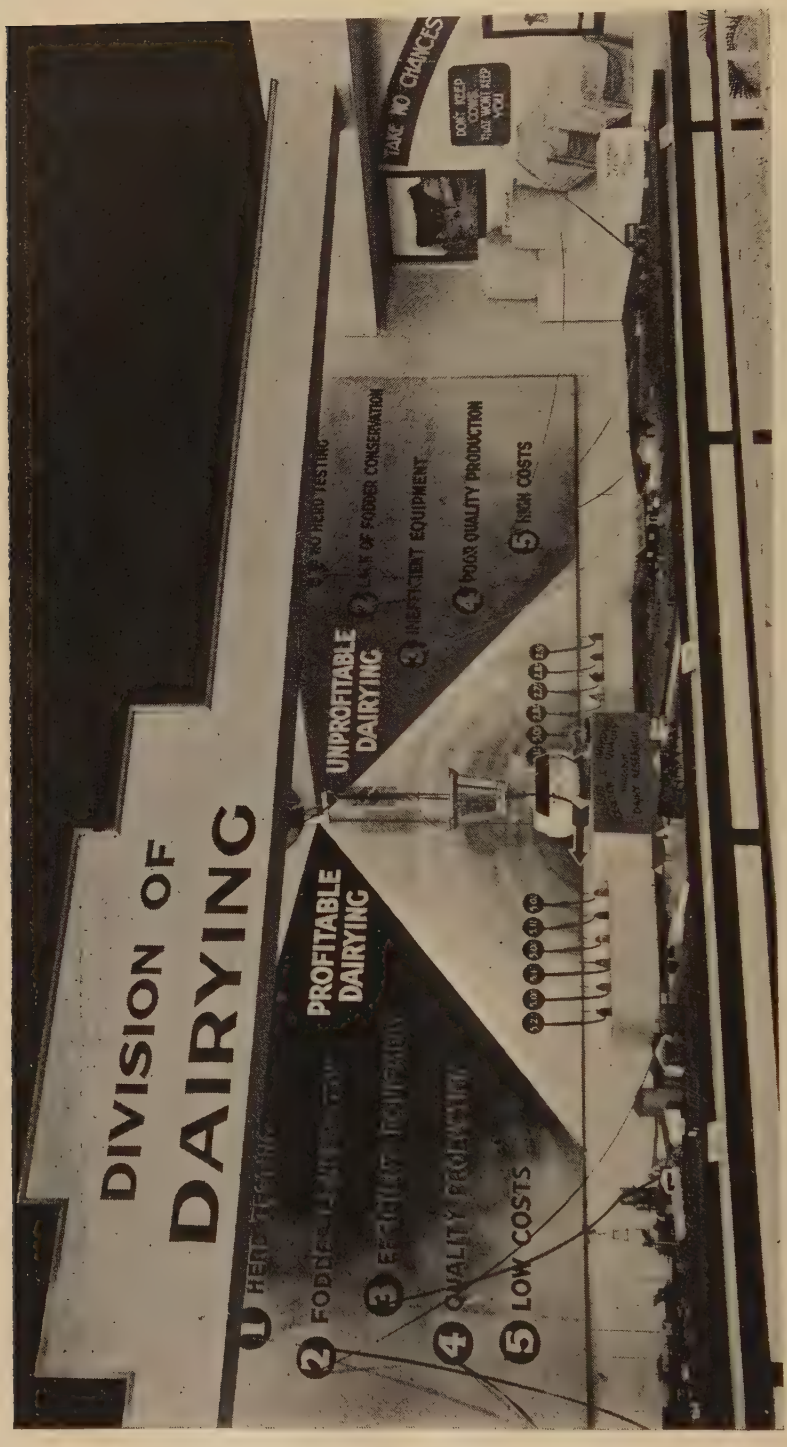

Plate 81.

An Educational Contrast in the Display of the Division of Dairying.

Plate 82.
Orchard Practice and its Products were well Illustrated in the Court of the Department of Agriculture.

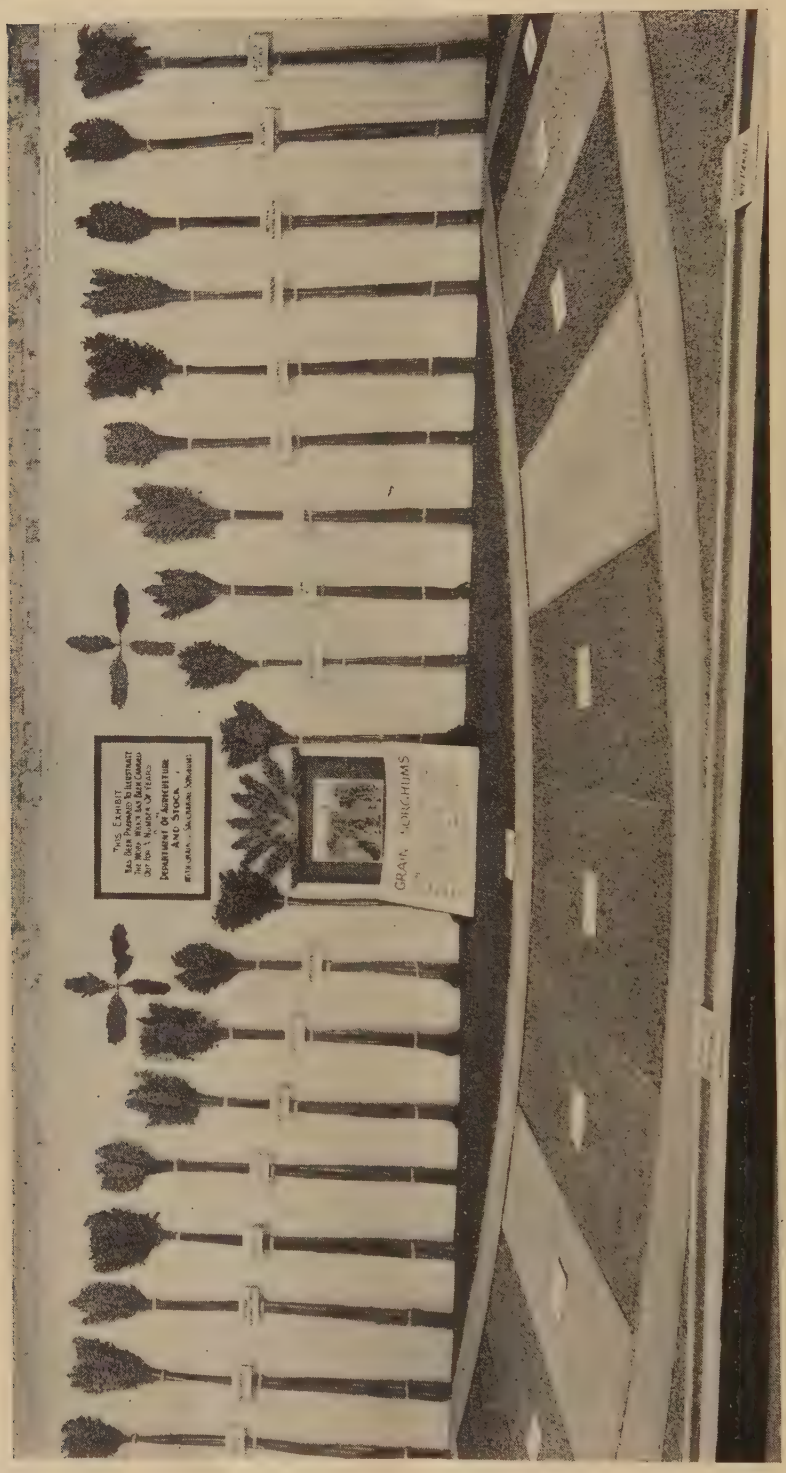

Plate 83.

GRAIN SORGHUM IN SHEAF AND GRAIN.

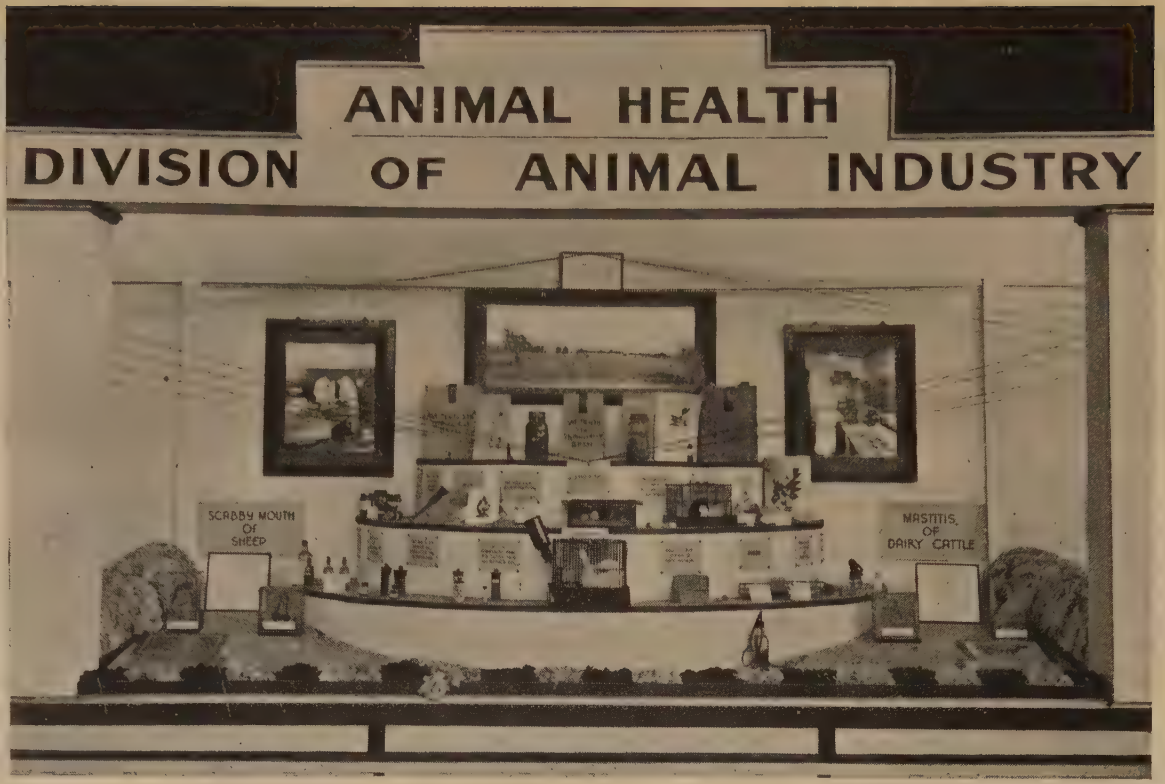

Plate 84.

VETERINARY SCIENCE AND ITS TIES WITH THE LAND INDUSTRIES WAS THE THEME OF THIS DISPLAY.

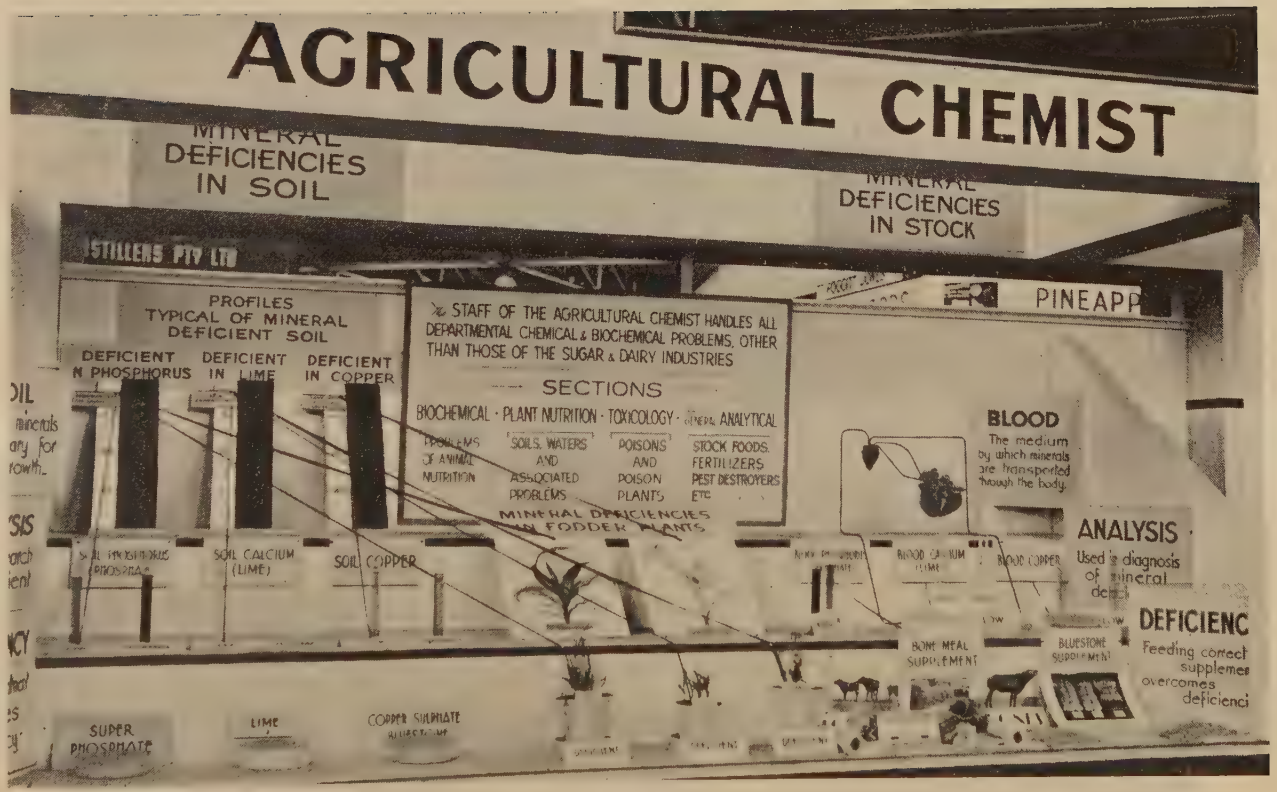
AGRICULTURAL CHEMIST
MINERAL DEFICIENCIES IN SOIL
MINERAL DEFICIENCIES IN STOCK
STILLERS PTY LTD
PROFILES TYPICAL OF MINERAL DEFICIENT SOIL
DEFICIENT N PHOSPHORUS
DEFICIENT IN LIME
DEFICIENT IN COPPER
STAFF OF THE AGRICULTURAL CHEMIST HANDLES ALL DEPARTMENTAL CHEMICAL & BIOCHEMICAL PROBLEMS, OTHER THAN THOSE OF THE SUGAR & DAIRY INDUSTRIES
SECTIONS
BIOCHEMICAL · PLANT NUTRITION · TOXICOLOGY · MINERAL ANALYTICAL
PROBLEMS OF ANIMAL NUTRITION
SOILS, WATERS AND ASSOCIATED PROBLEMS
POISONS AND POISON PLANTS
STOCK FOODS, FERTILIZERS PEST DESTROYERS ETC
MINERAL DEFICIENCIES IN FODDER PLANTS
SOIL CALCIUM (LIME)
SOIL COPPER
BLOOD
The medium by which minerals are transported through the body.
ANALYSIS
Used in diagnosis of mineral
DEFICIENC
Feeding correct supplemes overcomes deficienci
BONE MEAL SUPPLEMENT
BLUESTONE SUPPLEMENT
SUPER PHOSPHATE
LIME
COPPER SULPHATE
PINEAPP

Plate 85.

THE LINK BETWEEN THE LAND AND THE LABORATORY.

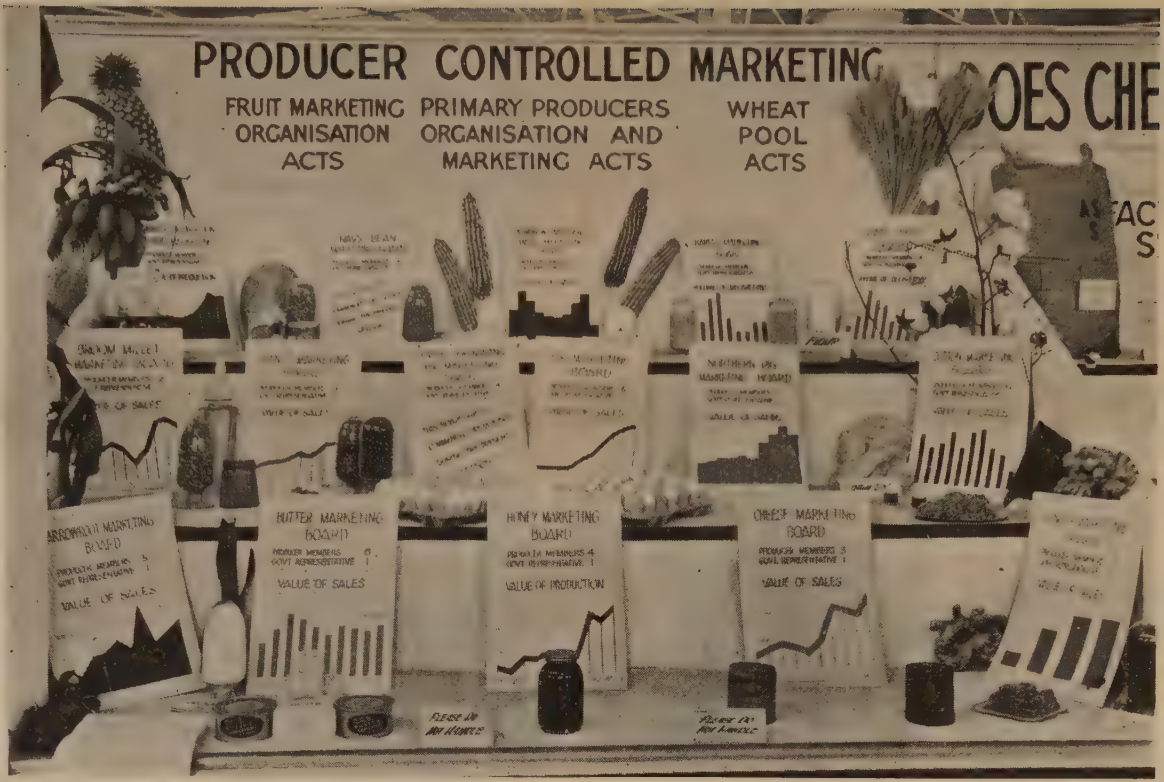

Plate 86.

THE FARMER AND HIS MARKET.—The Economics of Agriculture Well Illustrated in the Display of the Division of Marketing.

Plate 87.

How to Store Stock Food.—Scale Models of Silos—trench, pit, stack, and tower—illustrated the case for Fodder Conservation.

Plate 88.

Land to Have and to Hold.—Scale Model Farms showed how soil is saved—and lost.

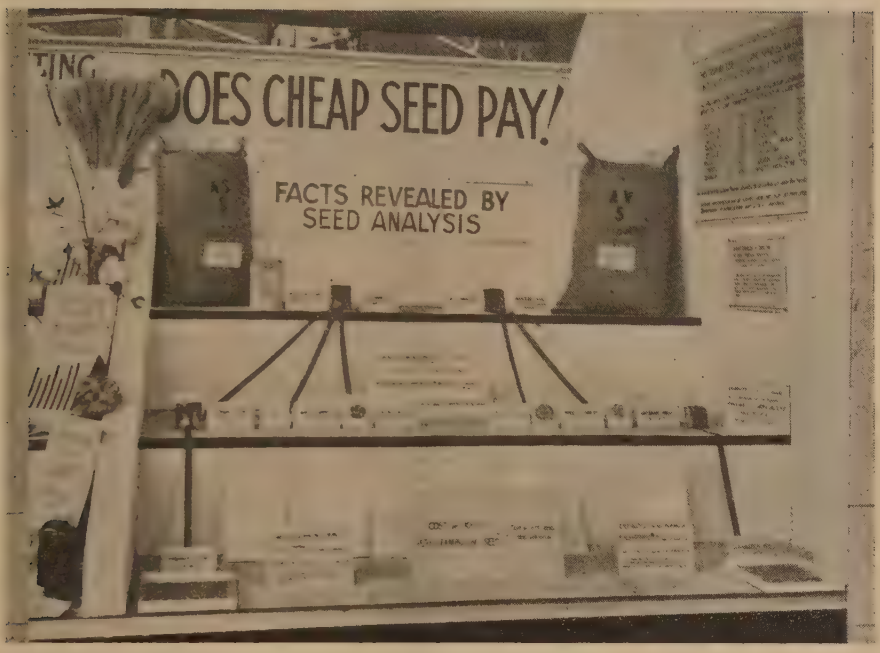

Plate 89.

THE STANDARDS BRANCH SHOWED HOW THE FARMER IS PROTECTED IN HIS SEED AND OTHER PURCHASES.

Plate 90.

THE JOURNAL CORNER OF THE DEPARTMENTAL COURT.—Mr. George Thompson in charge.

MARKETING

Production Trends—August.

Dairy cattle have wintered well and are in fair to good condition. Relief rains in most dairying districts cause a renewal of the growth of herbage and fodder crops and, although pastures were dry, there was a good body of rough grass in most districts.

On the Atherton Tableland 9,500 tons of maize had been delivered to the Atherton Tableland Maize Marketing Board by the end of August. It is expected that the crop in that area will total 19,000 tons. Excellent yields are reported from the South Burnett, but the crop is expected to be below average on the Darling Downs.

The long period of favourable weather for cotton harvesting was broken at mid-August and again at the end of the month by general rains. Generally, the grades for the season have been surprisingly good considering the seasonal conditions.

Tobacco leaf from the Texas, Yelarbon, and Inglewood districts cured fairly bright with fair to good body, but on the average quality was below that of the previous season. It is estimated that the yield from these districts will be 928,000 lb. It is expected that 950,000 lb. of leaf will be appraised from the Mareeba-Dimbulah area.

Some early sowings of wheat on the Darling Downs were beginning to come into ear by the end of the month.

With the exception of a few mills, crushing of sugar cane was in full swing in all areas during the month. Indications are that some far northern mills will exceed estimates, but in most central and southern areas the trend is downward. The Queensland estimate of 550,000 tons of sugar remains unchanged.

Maltings Premises.

Arrangements have been made by the Barley Marketing Board to rent the maltings premises at Black Gully, Toowoomba, from the Queensland State Wheat Board for the coming season. This will provide intake and storage facilities which will enable the Board to take delivery of barley from growers with greater despatch than has been the case for some years.

Tobacco Marketing.

The Commonwealth Department of Commerce and Agriculture and the Departments of Agriculture of the tobacco-growing States are examining proposals to constitute an organization for the orderly marketing of tobacco leaf to replace the existing marketing organization which was established during the war under the *National Security* (*Australian Tobacco Leaf*) *Regulations.*

Legislation will require to be enacted by the States, with complementary Commonwealth legislation. The Marketing Division of the Department is at present engaged, at the request of the Australian Agricultural Council, in drafting a model bill for early submission to the other tobacco-growing States of Western Australia, Victoria and New South Wales.

New Zealand Dairy Commission.

The New Zealand Prime Minister (Right Hon. P. Fraser) has announced intention of his Government to introduce legislation to set up a New Zealand Dairy Commission to determine the guaranteed price for dairy produce each season, and to administer the marketing of the industry's products. The Commission will have a chairman appointed by the Government and equal representation of the Government and the industry

GENERAL NOTES

Staff Changes and Appointments.

The designation of the position held by Mr. W. G. Wells, of the Department of Agriculture and Stock, has been altered from Specialist Adviser, Experiment Stations, also Cotton Specialist, to Director of Regional Experiment Stations.

Farmers' Wool Disposal Scheme.

The Farmers' Wool Scheme was originated by the Department of Agriculture and Stock with the object of ensuring that the small sheep owner received full value for his wool. It has grown from small beginnings to a business of considerable size. During the past season, 747 bales were classed on behalf of 267 growers, and at the last sale of the season, a price of 46¾d. per lb. was realised for one bale, which topped the catalogue of the selling broker for the day.

One of the main objects of the scheme is the bulking of wools of similar type and quality to avoid star lots. The bulk lots are sold on the main floor and participate in competition from overseas buyers.

Farmers owning 1,500 sheep or fewer are given a first advance by the Department of Agriculture and Stock of 60 per cent. of the estimated value of the consignment without any interest charge. The wool is weighed on arrival at the Department and is then classed and repacked, for which a charge of ¾d. per lb. is made. Other charges are those which would be normally incurred in the ordinary course of business.

Consignments are treated in the order of their receival, though at times it is necessary to hold a line until a suitable matching is available, and it is because of this possible delay that the first advance is made to the farmer.

All wool received is handled by expert classers and even locks go over the table.

Panicum and Millet Seeds for Sowing.

The Minister for Agriculture, Hon. H. H. Collins, in commenting on the current demand for panicum and millets said that the producers of these grains should take steps to reserve sufficient seed for the coming plantings. Most of Queensland's production of these grains is sold in Southern States or exported; consequently, it would be necessary to rely upon stocks held in Queensland for the next plantings.

THE AUSTRALIAN PLAGUE LOCUST.

Last year, outbreaks of the Australian plague locust occurred in the three eastern States. Such outbreaks usually last for three years or so. Hopper swarms may therefore prove troublesome in Southern Queensland this spring. Hatching has been reported already from Dirranbandi and Mr. Weddell, an entomologist of the Department of Agriculture, has left for this and other areas where outbreaks may be expected. He will be accompanied by Stock Inspectors familiar with the local situation and will thoroughly investigate the position.

Poison bran baits will be used extensively if an attack occurs in the more closely settled districts. Arsenic pentoxide was the poison used in these baits during earlier campaigns against the pest. However, the new insecticide gammexane is more efficient than arsenic pentoxide and it is virtually non-poisonous to stock. Gammexane will therefore replace arsenic pentoxide wherever possible. Limited stocks of gammexane are available in Brisbane but they should be sufficient for current requirements. Additional supplies will be obtained by the distributors (A.C.F. & Shirleys Fertilizers Ltd.) as soon as possible.

Should a control campaign be required on the Darling Downs, the Department of Agriculture will co-operate in every possible way with the Local Authorities who supervise the application of the bait within their boundaries.

GADGETS AND WRINKLES

THE TANK SITE.

Very careful consideration should be given to the selection of a site for a tank. The most important point is a good catchment, and this, on some holdings, is almost the sole determining factor.

In undulating country catchments are generally good, and no difficulty is experienced, but in the flat country of the western plains levels should be taken. Tanks have been made where water would not flow into them and land often appears level when it has a fall of several inches.

Very often shallow watercourses exist, and the tank should be located on or near these. Roads provide satisfactory catchments, and a good flow of water can be obtained off the hard bare patches which exist on the plains.

In selecting catchment attention should be given to the nature of the country; for instance, a drain running over hard compact soil will carry more water into the tank than one running over black soil, which develops large cracks during drought periods, and which absorbs a large amount of water before any reaches the tank.

The catchment must have sufficient area to catch enough water to fill the excavation in good heavy rains; a large area with a gentle grade is preferable to too steep a catchment, for with the latter serious scouring is likely to occur, with increased silting of the tank itself during heavy rains.

Guard Against Pollution.

Tanks or dams may be placed so as to water more than one paddock if required. If the paddocks are large, however, it is better to place the excavations as near the centre as possible, in order that stock may not have to travel too far to water, and will not tread down the grass so much going to and fro.

See that the area is kept clean and does not contain pigsties, sheepyards, &c.

Shade-trees should not be left in the catchment, but rather below it, so that the excreta from stock camping under them may not be washed into the tank and pollute the water.

Stock come to water in the morning and like to linger round in the shade, taking frequent drinks before moving off in the afternoon.

If shade is not available they probably take only one drink in the day, and consequently do not do as well as they otherwise would.

Sink Trial Shafts.

After locating what is apparently a good site, the nature of the soil should be ascertained. On some country a tank will hold well almost anywhere, but in other classes of soil some considerable difficulty is experienced, and recourse must be made in some cases to puddling.

The nature of the timber is usually indicative of the character of the subsoil, but is not always reliable.

Occasionally the country is patchy; while the subsoil in portion of the tank is good, a band of a porous character may be struck, which will cause a leakage.

Before sinking is commenced trial shafts should be sunk to the depth it is proposed to excavate the tank, and if it is considered the country is patchy two or three should be put down.

An experienced man can tell by the nature of the subosil whether or not it will be "good holding," but if there is any doubt a test should be made by partly filling the shaft with water, so that its holding capacity can be ascertained.—*N.S.W. Agricultural Department Extension Service.*

Care of Mother and Child.

Under this heading an article supplied by the Maternal and Child Welfare Service of the Department of Health and Home Affairs, dealing with the welfare and care of mother and child, is published each month.

BETWEEN TWO YEARS AND SIX.

IN these days of progress in health matters one of the outstanding achievements of science is the increase in our knowledge of the care and education of children. We understand better than ever before the facts of bodily and mental growth and development and the influences which affect this development.

The child of today has a better chance than the child of 10 or 20 years age to grow into a useful citizen and live to a ripe old age. Progress in medical science, the work of child welfare organizations and other social services and the amount of education available to parents are all helping in this much-to-be desired result.

Nevertheless, we still find many children physically under-developed, mentally retarded, emotionally unstable and badly adjusted to their environment. The combined efforts of parents and welfare workers must operate continuously to ensure that every child has the chance of a full and satisfactory life.

Too many mothers think that once the "baby stage"—*i.e.*, the first year or 18 months—is over the most worrying part of their child's life is past. But this is not so. The change from infancy to childhood comes between two years and six and is a period of great physical and mental growth. Because of this it is most important that parents should not relax their care and watchfulness of the child after his first year. The problems that confront the conscientious parent require more than instinct for their solution and in a short series of articles we hope to point out how the toddler or pre-school child may be kept well and his mind and body developed in a healthy, normal way.

It should be remembered, however, that books and articles cannot take the place of the doctor at your toddler's health centre, if there is one in your district, or your family doctor or the sister at your local welfare centre who has probably helped you through the ups and downs of the child's baby days.

So remember to keep your toddler weighed regularly and have his diet checked and see that he has a complete physical examination by a doctor preferably once each six months but at least once a year. The dentist should examine the child's teeth every six months also. When periodic health examinations are made by the same doctor each time it is easier for him to detect disturbances of growth in time to prevent permanent physical defects or correct those which have developed. Faulty mental habits may also be checked before they lead to permanent trouble. Watch for the next two to six years' talk.

Further advice on this and other matters can be obtained by communicating personally with the *Maternal and Child Welfare Information Bureau*, 184 *St. Paul's Terrace, Brisbane*, or by addressing letters, *Baby Clinic, Brisbane*. These letters need not be stamped.

IN THE FARM KITCHEN.

Cook Potatoes Properly.

Potatoes supply the vitamins A, B, C, and D, all of which are necessary to health. If they are unduly fattening, it is mainly because of the method of cooking. They are often fried in fat insufficiently hot, and so they absorb the fat, or they are not properly drained after being fried, or they are peeled so thickly and the "eyes" taken out so badly that much of the valuable outer layer is lost and little but the starchy parts remain. Consequently, they are inclined to be more fattening than nourishing. Potatoes are also boiled day after day instead of being steamed, and often they are allowed to get mushy, which means that again it is chiefly the starchy part which is left. Preserve the good of the potato when cooking the vegetable. Either roast them or boil or steam them in their jackets. Provided the peeling is done thinly, cooking potatoes in a stew, broth, or any casserole dish is an excellent way of conserving all their nourishment. Potatoes are very useful vegetables, they can be added to so many casserole dishes, served in so many different ways. Serve left-over potatoes in salads or in fish or meat rissoles. Left-over potatoes made into potato cakes are delicious at tea-time, and very handy for breakfast.

Parsley Savoury.

Mix together some sieved breadcrumbs, chopped parsley, onion, thyme, marjoram, and a nut of dripping, and moisten with cold water. Put into a greased dish and cook in the oven for about ten minutes. A sage savoury is made in the same way with breadcrumbs, onion, sage, dripping, and water.

Jubilee Loaf.

Six ounces of self-raising flour, 1 oz. butter, 1 oz. sugar, 3 oz. mixed fruit, 1 egg, ½ cup milk, pinch salt, nutmeg or spice, vanilla. Sift flour and spice, rub in butter, add sugar and fruit. Beat the egg, add milk and vanilla, and pour into dry ingredients; place in well-greased bar tin. Bake in moderate oven about 35 minutes. While still warm ice with two tablespoons icing sugar mixed with a little milk. Slice and spread with butter.

Oaten Girdle Cakes.

Four ounces medium oatmeal or rolled oats, 2 oz. wheatmeal, 2 oz. flour, ½ teaspoon baking soda, 1 teaspoon cream of tartar, ½ teaspoon salt, 1 oz. fat, milk to mix. Measure the dry ingredients into a basin and rub in the fat. Mix to a soft dough with milk and roll out ¼ in. thick. Cut in triangles and cook on a floured girdle or in a thick frying-pan.

Apple Turnovers.

Roll some short pastry out as thick as a florin, cut with round cutter, place some sliced apples in centre, sprinkle with sugar and a little spice, wet the edge and close over, wash over with milk, bake in a fairly warm oven for 20 minutes.

Cornish Pasties.

Half-pound beef skirt, ½ lb. potatoes, 1 onion, 4 oz. dripping, 1 teaspoon baking powder, 1 lb. flour, salt and pepper. Chop meat into small pieces. Peel, wash and mince potatoes. Peel and mince onion. Sift together into a bowl, flour, salt and baking powder. Rub in dripping and mix with cold water to a stiff paste. Turn pastry on to a lightly floured board. Roll out to a ¼ in. thickness and cut into 6 in. or 7 in. squares. Place a little of the mixture in the centre of each square. Season to taste with pepper, salt and onion. Fold the paste over the meat, joining it by pressing the edges together with thumb and finger. Bake on greased tins in a quick oven for 30 to 35 minutes.

Drop Scones.

Half pound plain flour, 1 teaspoon baking powder, pinch of salt, 1 egg, ½ pint milk, or milk and water. Sift the dry ingredients into a mixing bowl. Beat up the egg with a little of the milk. Pour into a well in the centre of the flour, stir the mixture, gradually adding the rest of the liquid. The batter should be fairly stiff. Beat the mixture with a wooden spoon. Place in spoonfuls on a hot, greased frying pan or hot plate. Brown one side, turn, and brown the other side. Spread with butter and serve very hot.

QUEENSLAND WEATHER IN AUGUST.

Seasonal prospects were considerably enhanced during August by a series of valuable rains which spread over the greater part of the State, giving relief to the dry central-west, central-interior and adjacent highlands. The additional falls in the south-west and Warrego further enhanced the already good prospects in those districts, a considerable contrast to the dry and drought conditions of the past few years. Parts of the central coast could do with more rain but over the great bulk of pastoral country bright early season prospects are being experienced. Although district aggregate rains in the dry farming districts of the Downs and South Coast were somewhat below normal, they came at an opportune time and have been followed by good soaking falls during the first three days of September, which ranged up to one and half to three inches on the Downs. These should greatly improve general farming and dairying prospects and strengthen anticipations of a heavy 7,000,000 to 8,000,000 bushel wheat yield. Showers with local moderate falls were recorded on the far north tropical coast during the first week of the month and there were some scattered and moderate rains in the Peninsula and Carpentaria on the 6th and 7th. During the week-end 9th to 11th, general good to heavy amounts were recorded in the sub-tropical interior, penetrating to parts of the Central Highlands and Upper West by the 12th. The best rains of the month commenced in the Upper West early in the week-end, 16th to 18th, and spread eastward and southward over the State till the 20th. Week-end totals in the Upper West, central interior and south-west contained many one and a half to over two inch registrations.

As shown in the rainfall table many inland areas received record or near record August totals.

Records.—

Laura	310	Muttaburra	301	
Palmerville	365	Tangorin	280	Ayrshire Downs, 232 highest since 233 in 1886
Cloncurry	298	Selwyn	308	
Granada	123	Urandangie	248	Winton, 195 highest since 272 in 1886
Aramac	267	Muckadilla	303	Boulia, 338 highest since 409 in 1886
Longreach	233	Quilpie	249	

Temperatures.—Average maximum temperatures in the tropical half of the State ranged from 0.5 deg. below at Cairns to 1.2 deg. above at Rockhampton. Minimum temperatures were generally above normal from 0.9 deg. at Thargomindah to 6.1 deg. at Mitchell and over 4 deg. in several districts. Stanthorpe recorded 40 deg. and under in the screen on 22 nights mainly between 1st to 7th, 12th to 17th, 22nd to 30th. Lowest minimum readings:—Tambo 29 deg. and 23 deg. (14th); Kingaroy 30 deg. and 25 deg. (15th); Bybera 29 deg. and 19 deg. (14th) (18 nights 30 deg. and under); Stanthorpe 25 deg. and 18 deg. (14th) (20 nights 30 deg. and under); Mitchell 31 deg. and 25 deg. (27th).

Fog Patches south coast 5th, 7th, 8th, 9th, 12th, 14th, 16th Palmerville; 28th Karumba; Downs, south coast, Central Highlands 13th; southern interior and Downs 18th and 19th.

Brisbane.—Pressure $\frac{9+3}{2}$ 30.091 inches (normal 30.093). *Temperature.*—Mean maximum 70.6 deg. (normal 71.3 deg.); mean minimum 51.5 deg. (normal 50.0 deg.); mean temperature 61.1 deg. (normal 60.7 deg.) Highest daily 78.0 deg on 6th. Lowest daily deg. 43.6 deg. on 28th. *Rainfall.*—50 points on 6 days; average 188 points on 7 days. *Sunshine.*—208.3 hours, 34.4 below normal. Maximum wind gust, westerly 40 m.p.h. on 24th. *Frost.*—Suburbs 1 on 26th. *General Fog.*—1 on 20th. Fog or mist patches 10.

Rain position is summarised below:—

Division.	Normal Mean.	Mean August, 1947.	Departure from Normal.
	Points.	Points.	Per. Cent.
Peninsula North	20	47	135 above
Peninsula South	7	285	3971 ,,
Lower Carpentaria	10	113	1030 ,,
Upper Carpentaria	25	37	48 ,,
North Coast Barron	114	436	282 ,,
North Coast Herbert	167	351	110 ,,
Central Coast East	77	134	74 ,,
Central Coast West	50	77	54 ,,
Central Highlands	84	177	111 ,,
Central Lowlands	48	263	448 ,,
Upper Western	16	183	1044 ,,
Lower Western	32	254	694 ,,
South Coast, Port Curtis	118	183	55 ,,
South Coast, Moreton	169	121	28 below
Darling Downs, East	131	94	28 below
Darling Downs, West	88	188	114 above
Maranoa	91	246	170 ,,
Warrego	75	199	165 ,,
Far South-West	49	213	334 ,,

Commonwealth of Australia, Meterological Bureau, Brisbane.

ASTRONOMICAL DATA FOR QUEENSLAND.

OCTOBER.

Supplied by W. J. Newell, Hon. Secretary of the Astronomical Society of Queensland.

TIMES OF SUNRISE AND SUNSET.

At Brisbane.			MINUTES LATER THAN BRISBANE AT OTHER PLACES.					
Day.	Rise.	Set.	Place.	Rise.	Set.	Place.	Rise.	Set.
	a.m.	p.m.						
1	5.29	5.47	Cairns	36	22	Longreach	38	31
6	5.23	5.49	Charleville ..	28	26	Quilpie	34	35
11	5.18	5.52	Cloncurry	55	45	Rockhampton ..	13	7
16	5.13	5.55	Cunnamulla ..	29	30	Roma	18	16
21	5.07	5.58	Dirranbandi ..	18	20	Townsville ..	30	19
26	5.03	6.01	Emerald	22	16	Winton	44	36
31	5.00	6.04	Hughenden ..	40	30	Warwick	3	4

TIMES OF MOONRISE AND MOONSET.

At Brisbane.		
Day.	Rise.	Set.
	p.m.	a.m.
1	6.43	6.03
2	7.41	6.35
3	8.43	7.09
4	9.47	7.48
5	10.53	8.32
6	11.57	9.23
7	..	10.20
	a.m.	
8	12.58	11.24
		p.m.
9	1.54	12.31
10	2.43	1.38
11	3.26	2.45
12	4.05	3.49
13	4.40	4.51
14	5.14	5.53
15	5.47	6.53
16	6.22	7.54
17	6.58	8.53
18	7.38	9.52
19	8.22	10.49
20	9.11	11.42
21	10.02	..
		a.m.
22	10.56	12.30
23	11.51	1.13
	p.m.	
24	12.46	1.52
25	1.42	2.28
26	2.37	3.00
27	3.33	3.31
28	4.30	4.02
29	5.29	4.33
30	6.31	5.07
31	7.36	5.45

MINUTES LATER THAN BRISBANE (SOUTHERN DISTRICTS).

Charleville 27; Cunnamulla 29; Dirranbandi 19;
Quilpie 35; Roma 17; Warwick 4.

MINUTES LATER THAN BRISBANE (CENTRAL DISTRICTS).

Day.	Emerald.		Longreach.		Rockhampton.		Winton.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	17	19	33	36	8	10	37	41
6	9	30	25	44	0	20	26	53
11	13	24	29	40	3	15	32	46
16	24	13	41	28	16	3	47	32
21	30	10	46	24	21	0	53	27
26	23	14	39	30	14	5	44	34
31	13	25	28	41	2	19	31	49

MINUTES LATER THAN BRISBANE (NORTHERN DISTRICTS).

Day.	Cairns.		Cloncurry.		Hughenden.		Townsville.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	25	31	47	51	32	36	21	26
3	14	41	39	58	24	44	13	35
5	6	50	35	63	20	49	6	42
7	3	55	34	67	18	52	4	45
9	6	50	35	63	20	49	6	42
11	15	40	40	58	25	43	14	34
13	26	30	47	50	32	35	22	25
15	37	18	55	43	40	27	31	17
17	46	9	62	36	47	22	38	9
19	53	4	67	33	50	19	44	5
21	55	4	68	33	51	19	45	5
23	51	6	65	34	49	20	42	7
25	42	13	58	39	43	24	35	13
27	32	24	52	46	36	31	26	21
29	21	34	44	54	29	39	18	29
31	11	44	38	60	23	46	10	37

Phases of the Moon.—Last Quarter, October 7th, 8.29 p.m.; New Moon, October 14th, 4.10 p.m., First Quarter, October 22nd, 11.11 a.m.; Full Moon, October 30th, 6.07 a.m.

On October 15th the Sun will rise and set 10 degrees south of true east and true west respectively, and on October 14th and 28th the Moon will rise and set almost at true east and true west respectively.

Mercury.—An evening planet all this month. On the 1st, in the constellation of Virgo, it will set 1 hour 40 minutes after the Sun. On October 13th it will reach its greatest angle east of the Sun and will then set 1 hour 55 minutes after sunset. At the end of the month, in the constellation of Libra, it will set 1 hour after the Sun. About the 21st it will be between Jupiter and Venus, but at the end of the month Venus will lie between Jupiter and Mercury.

Venus.—Too close in line with the Sun for observation at the beginning of October, but towards the end of the month may be seen low in the west during evening twilight. On the 29th it will pass about 3 degrees north of Mercury, and at the end of the month, in the constellation of Libra, will be lower in the sky than Jupiter and will set 1 hour 10 minutes after the Sun.

Mars.—At the beginning of the month will rise between 2 a.m. and 3 a.m., and at the end of the month will rise between 1 a.m. and 2 a.m.

Jupiter.—In October will be seen low in the west during evening twilight. At the beginning of the month will set between 9.30 p.m. and 10.30 p.m., and at the end of the month will set about 2 hours after the Sun.

Saturn.—Now a morning object in the constellation of Leo, will rise between 3 a.m. and 4.15 a.m. at the beginning of October and will rise between 1.15 a.m. and 2.30 a.m. at the end of the month.

Star Charts.—The chart on the right is for 7.15 p.m. in the South-east corner of Queensland to 8.15 p.m. along the Northern Territory border on the 15th October. (For every degree of Longitude we go west the time will increase 4 minutes.) The chart on the left is for 9 hours later. On each chart the dashed circle is the horizon as viewed from Cape York and the dotted circle is the horizon for places along the N.S.W. border. When facing North hold "N" at the bottom; when facing South hold "S" at the bottom and similarly for the other directions. Only the brightest stars are included and the more conspicuous constellations named. The stars which do not change their relation to one another moving east to west arrive at any selected position about 4 minutes earlier each night. Thus at the beginning of the month the stars will be in the positions shown about one hour later than the time stated for the 15th, and at the end of the month about one hour earlier than that time. The positions of the moon and planets which are continually changing in relation to the stars are shown for certain marked days. When no date is marked the position is for the middle of the month.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

AUGUST RAINFALL.

(Compiled from Telegraphic Reports.)

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Aug.,	No. of years' records.	Aug., 1946.	Aug., 1947.		Aug.,	No. of years' records.	Aug., 1946.	Aug., 1947.
	In.		In.	In.		In.		In.	In.
North Coast.					*South Coast—contd.*				
Atherton	0·84	42	0·12	4·99	Caboolture	1·62	67	0·67	0·72
Cairns	1·65	61	0·13	4·94	Childers	1·21	48	0·48	2·11
Cardwell	1·22	71	0·12	3·11	Crohamhurst	2·17	50	0·13	1·12
Cooktown	1·17	67	0·33	5·36	Esk	1·39	56	0·42	0·58
Herberton	0·61	57	0·15	2·77	Gatton College ..	1·08	44	0·42	0·64
Ingham	1·44	51	0·03	1·41	Gayndah	1·12	72	0·52	0·88
Innisfail	4·85	62	0·29	9·39	Gympie	1·65	73	0·50	2·12
Mossman	1·34	19	0·10	5·28	Kilkivan	1·35	62	0·46	1·51
Townsville	0·50	72	Nil	3·25	Maryborough ..	1·61	72	0·64	1·24
					Nambour	1·88	47	0·04	1·43
Central Coast.					Nanango	1·29	61	0·59	1·25
Ayr	0·58	56	Nil	0·83	Rockhampton ..	0·82	72	0·01	2·26
Bowen	0·72	72	Nil	0.22	Woodford	1·61	55	0·45	..
Charters Towers ..	0·50	61	Nil	1·12					
Mackay	1·09	72	Nil	1·57	*Darling Downs.*				
Proserpine	1·45	40	Nil	2·10	Dalby	1·16	73	0·03	0·66
St. Lawrence ..	0·79	72	Nil	3·43	Emu Vale	1·06	47	0·30	0·42
					Jimbour	1·10	64	0·20	0·49
Central Highlands.					Miles	1·08	58	0·07	1·29
Clermont	0·70	72	0·03	1·17	Stanthorpe	1·73	70	0·30	0·90
Springsure	0·99	74	0·61	2·29	Toowoomba	1·58	71	0·58	1·05
					Warwick	1·40	78	0·05	0·66
South Coast.									
Biggenden	1·04	44	0·35	0·96	*Maranoa.*				
Bundaberg	1·27	60	0·13	1·47	Roma	0·86	69	Nil	2.40
Brisbane Bureau ..	1·89	95	0·40	0·50	St. George	0·91	62	Nil	3·52

CLIMATOLOGICAL DATA FOR AUGUST.

(Compiled from Telegraphic Reports.)

Divisions and Stations.	Atmospheric Pressure Mean at 9 a.m.	Shade Temperature.		Extremes of Shade Temperature.				Rainfall.	
		Mean Max.	Mean Min.	Max.	Date.	Min.	Date.	Total.	Wet Days.
Coastal.	In.	Deg.	Deg.	Deg.		Deg.		Pts.	
Cairns	..	79	66	83	13, 14, 15	54	26	494	13
Herberton	..	73	55	82	20	39	25, 26	277	11
Townsville	..	79	63	83	3, 14	48	27	325	5
Rockhampton	30·12	77	54	83	8, 13, 14, 15	41	26	226	4
Brisbane	30·14	71	52	78	6	44	28	50	6
Darling Downs.									
Dalby	..	69	43	79	15	32	15	66	5
Stanthorpe	..	61	37	71	6	25	14	90	7
Toowoomba	..	63	43	75	6	34	29	105	5
Mid-Interior.									
Georgetown	30·00	87	60	99	17	43	24	20	2
Longreach	30·13	78	49	91	8	32	13	238	4
Mitchell	30·15	69	45	79	6, 7	31	27	302	7
Western.									
Burketown	..	86	62	91	8, 12, 19	50	26, 27	16	1
Boulia	30 07	75	54	87	6, 28, 30	44	1, 24	338	5
Thargomindah	30·11	68	46	88	10	36	1	212	5

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